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Reflecting on the Glasgow General Assembly

WCLM Generates Ideas
for IYC2011

Toxicology in the
Classroom



From the Editor

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Where is IUPAC located? This is a question I have been asked often and it is somewhat of a puzzle to come up with a precise answer. I can answer “nowhere” and “everywhere there is a member.” Of course, most people asking the question want to know where the office of the Secretariat is located. To that, I can answer that for the last 12 years or so, the Secretariat has been located in the Research Triangle Park area in North Carolina, USA. Yet, I should add that this location is sort of virtual



because of its relative remoteness and the fact that the office hosts only a staff of five. Likewise, all other “key players” are all over the world: the Union officers are currently in Australia, Canada, France, Ireland, and Korea, and others, from divisions and standing committees, are from Austria, Denmark,

Germany, Italy, Japan, Netherlands, New Zealand, Norway, South Africa, Sweden, Switzerland, and UK. So, really, when I am asked “Where is IUPAC located?” my preferred way to answer is “everywhere.”

Moreover, in addition to the office’s physical location in North Carolina, the Secretariat depends on the regular work of several contractors, who work remotely from various U.S. locations, including Louisiana, Maryland, New York, and from abroad, such as the Czech Republic. My own IUPAC ID bears an address in Boston, Massachusetts. Beside all that, there is yet another address of which I like to remind folks, and that is the official address in the Canton of Zürich, Switzerland, where IUPAC has been chartered since 1967.

It is not surprising really for such an international organization to be delocalized. What is more surprising is that IUPAC is not significantly more international today than 50 years ago when technology had not yet made the entire world easily accessible through the Internet. Today, Skyping a colleague 10 000 kilometres away is now easier (and cheaper) than a phone call across the pond a few years ago. (So, how could IUPAC make better use of contemporary communication technology to further its reach? That is a different question, and if you have ideas, do let us know.)

To me, it does not really matter where IUPAC is located. Its location is in flux, in place and time, and what really grounds the organization are the individuals and groups of folks who are actively involved. So, to that point, and as this issue clearly attests, in August of this year IUPAC was located in Glasgow, Scotland. If you were not present, we hope that these accounts will give you a sense of what happened during the General Assembly. We also hope that you will develop a little envy of those who were involved and make plans to participate in the next assembly. To do so, visit www.iupac2011.org . . . then, in August 2011, IUPAC will be located in Puerto Rico.

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www.iupac.org/publications/ci

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Past President's Column

Reflections

by Bryan Henry



As my term on the IUPAC Executive Committee comes to an end, I will use this article to look back on some of the changes and highlights that have occurred over the last six years. It has been a breathtaking ride! Working with the IUPAC community has been a wonderful pleasure and a great privilege.

The project system has matured since it was fully phased in within the 2002-2003 biennium. It has experienced both an overall increase in funds and an expansion to fully encompass the standing committees. The system has considerable flexibility, with opportunities for divisions or committees to obtain additional funds and for projects that reach beyond the usual mandates. With more than 1000 dedicated scientists worldwide involved in IUPAC projects, the system is one of our principal strengths. I have been both impressed and inspired by the reports of the division presidents and standing committee chairs. The Project Committee and the Evaluation Committee have both done an impressive job assessing proposals and monitoring project success, respectively. As we have learned the wrinkles of this new way of doing business, one of the beneficial side effects has been an increased dialog between officers and staff on the one hand, and divisions and committees on the other.

A welcome change in our General Assemblies has been the introduction of Round Table Discussions to allow small groups of Council delegates to discuss subjects of mutual interest in an informal and less challenging setting that is conducive to the easy exchange of ideas.

In July 2006, I had the great privilege of participating in the International Chemistry Olympiad, and that marked the beginning of IUPAC's involvement in this important event. We have made a commitment to provide ongoing financial support to the Olympiad to help to support the interest and enthusiasm of young people in chemistry.

Changes in the operational structure of IUPAC were proposed, but not accepted at two GAs. In response, an ad hoc Committee for Streamlining IUPAC Operations was established to look at operational efficiencies within the existing IUPAC structures.

The committee's recommendations were accepted by the Executive Committee in 2007 and implemented at the 2007 GA in Torino. I will not repeat the details of that report here (See "Streamlining IUPAC Operations," July-Aug 2007 *CI* <www.iupac.org/publications/ci/2007/2904/oc.html>). However, two of the changes have had an immediate positive impact. The first change led to more detailed annotated agendas for Council, Bureau and Executive Committee meetings, with proposed time allocations for each item, references and links to any supporting documentation, and a series of expected actions and possible motions. These changes have allowed us to deal with our business more expeditiously and given us more time to think strategically and to engage in real discussions of important matters. Secondly, a series of schedule changes has resulted in a shorter overall General Assembly, and an earlier beginning for the newly elected Executive Committee and Bureau members.

The Streamlining Committee also recommended that priority be given to improving the communication potential and utility of the IUPAC Web site. A great deal of progress has been made in this area but we continue our efforts to improve our electronic communication with the chemistry community.

The Member Relations Committee was formed in early 2007 to improve communications and liaison with existing members. Two issues in particular were how to keep our existing NAOs as productive members of the IUPAC community, and how to facilitate the conversion of ANAOs to NAOs. The committee has made a good start, but it is clear that more needs to be done, particularly in improving communications between ANAOs or NAOs and the officers and secretariat of IUPAC.

The most important IUPAC event that has occurred in the last few years is the declaration of the International Year of Chemistry (IYC) by the United Nations General Assembly in December 2008. The IYC is a once in a lifetime opportunity to recognize past, present, and future achievements in chemistry. Midway through my presidency, I was approached independently by our colleagues from Russia and Korea about the possibility of an international year for chemistry. The Russians wanted to celebrate Mendeleev's contributions by declaring an IYC in 2009. It quickly became clear that such a timeline was far too short, but we identified 2011 as a year in which we could celebrate the 100th anniversary of the founding of the International Association of Chemical Societies (which led to the

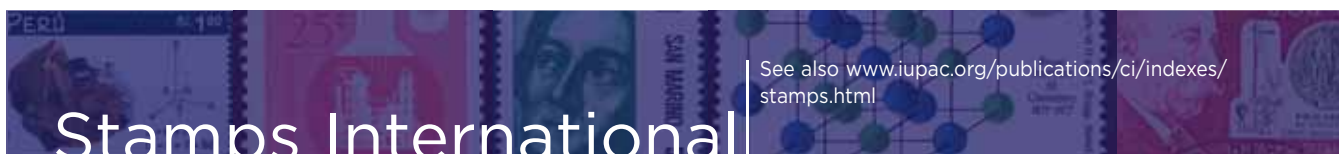
formation of IUPAC a few years later). In addition, we could celebrate the contributions of women to chemistry by recognizing the 100th anniversary of Marie Curie's Nobel Prize in chemistry.

I asked the Committee on Chemistry Education to oversee a process whereby we understood the procedures for the declaration of an international year and to carry through with our application. They did a marvelous job enlisting UNESCO support and mounting a campaign that ultimately led to the UN declaration. I would like to express my sincere gratitude and thanks to all those who were involved.

Of course, many other things occurred, but from my point of view these were the highlights. My great-

est joy and satisfaction came from interacting with the members of the IUPAC community. In particular, my colleagues on the Executive Committee are a dedicated and inspirational group. They are a great pleasure to work with as are the hard working members of the IUPAC Secretariat. My very heartfelt thanks and gratitude to you all. 🌐

Bryan Henry <chmhenry@uoguelph.ca> is IUPAC past president, a retiring member of the Executive Committee, and also chair of the Membership Relations Committee. Henry is a retired professor of chemistry in the Department of Chemistry and Biochemistry at the University of Guelph, Canada. He has been a member of the Canadian National Committee for IUPAC since 1995, and served as chair from 1998–2003.



See also www.iupac.org/publications/ci/indexes/stamps.html

Stamps International

Merry Christmas Phosphates

Phosphate rock, a combination of phosphate-rich minerals that includes several types of apatites, is the only economically viable source of phosphorus for the production of phosphate fertilizers and a myriad of other phosphorus-containing products.

Although not widely distributed in nature, it is mined on a huge scale in certain regions of the world. About three-quarters of the world's production, a whopping 167 million tonnes in 2008, comes from only four countries, namely the United States, China, Morocco, and Russia. On the other hand, Christmas Island, a small territory located in the Indian Ocean about 360 km south of Java (Indonesia) but administered by Australia since 1958, is one of the most peculiar if not particularly large exporters of phosphate rock, mainly because its economy has relied almost exclusively on its exploitation for over a century.

The first stamp illustrated in this note is part of a set of 16 issued by Christmas Island in 1980-81 to promote its phosphate industry. It shows a long line of volumetric flasks and a woman analyzing samples of phos-



phosphate rock, presumably to establish their phosphorus content (usually reported as P_2O_5). The other stamp, issued in 1988 to commemorate the centenary of the first permanent settlement on the island by the British, features the traditional way of mining phosphate rock. Interestingly, even though the annual output of phosphate rock on Christmas Island has remained steady in recent years at about 650 000 tonnes, the local economy has significantly shifted towards tourism, with a focus on nature walking, scuba diving, and bird watching. So, on 25 December, if the holiday season finds you longing for a trip to a paradisiacal island with a long history of phosphate mining, you know where to go . . .

Written by Daniel Rabinovich <drabinov@uncc.edu>.

Greetings from Glasgow



See ye after IUPACers!



IUPAC in Glasgow, Scotland

Roars from the Council Meeting

by Chris Brouwer



There was something decidedly different about this IUPAC Council meeting. Held 5-6 August 2009 at the tail end of the Union's General Assembly, the Council had all the trappings of previous meetings, but with a palpable feeling of optimism and momentum among the hundreds of representatives of National Adhering Organizations. Under the orderly guidance of Secretary General David StC. Black, Council members moved quickly through the more than 30 business items under consideration, and then IUPAC's formal meeting gave way to a pep rally of sorts for the International Year of Chemistry in 2011 (IYC2011).



Nicole Moreau delivers the Vice President's Critical Assessment.

Aside from IYC2011, the major news from the meeting was the election of Kazuyuki Tatsumi to be IUPAC's next vice president. Currently president of the Inorganic Chemistry Division, Tatsumi will start his term 1 January 2010.

Another highlight was Council's approval of National Adhering Organization status for six new organizations, bringing the number of NAOs to nearly 60. Joining IUPAC in 2010 are the Institute of Chemistry Ceylon, National Research Fund Luxembourg, Institut Kimia Malaysia, Saudi Chemical Society, Chemical Society of Thailand, and the Société Chimique de Tunisie. President Jung-Il Jin expressed his desire to have 100 members by 2019, the Union's 100th year. He pointed out that recent changes approved in the Bylaws allow new members to adhere every year, rather than every two years following the Council meetings.

Preparing for IYC

It was President Jin who led the charge to galvanize, energize, and mobilize those in attendance to become active in IYC preparations. He used much of his State of the Union Address to offer an impassioned answer to the question "How can we make IYC successful?"

Jin framed IYC2011 as "a turning point in convincing the world what we chemists can do for the resolution of global problems and ultimately for world sustainability." This tall order, Jin said, mainly depends upon IYC activities organized by national and regional chemistry groups.



Members of the Russian Delegation, Natalia Tarasova (left) and Oleg M. Nefedov.

"I am greatly encouraged to see the intense enthusiasm for IYC being generated in the chemistry community," Jin exclaimed. "Let's take this great opportunity to invigorate chemistry in the world, and thereby facilitate a renaissance in the chemical sciences. Global problems are waiting for answers from us."

Vice President Nicole Moreau echoed these sentiments in her Vice President's Critical Assessment, but placed them in the context of chemistry's poor public image and IUPAC's low visibility, even within the chemistry community. "There's not enough recognition of our activities outside of traditional areas such as nomenclature," Moreau insisted. "We need to show that we can assist in bringing rational scientific viewpoints."

The main message of Moreau's strong critique was that making IUPAC better known can help counteract the bad image of chemistry, but this depends, in large measure, on the efforts of those in the audience. "There needs to be more distribution of materials about IUPAC by each of us (delegates) back home," she said. "We must not be shy. Instead of thinking only about asking for something, we need to start presenting IUPAC as offering something of value: expert advice and solutions to problems."



Brynn Hibbert (left), Australia, and Paul DeBievre, Belgium

Moreau implored Council delegates to ask themselves whether they use and distribute material developed by IUPAC to explain to others what IUPAC is all about, especially at meetings of national chemical societies. In closing, she suggested that IYC, if successful, will not only improve the image of chemistry, but will boost the prestige of IUPAC and attract new members: "a win-win situation."

Much of the remainder of the meeting was devoted to reporting on IUPAC members' ideas for moving forward with celebrating, publicizing, and organizing IYC2011. These ideas, compiled over the course of the GA, sprung from multiple sources: division and committee meetings, the World Chemistry Leadership Meeting, and the Council Roundtable Discussions. In fact, every meeting that took place at the GA had IYC2011 as an agenda item, and it showed. Speakers introduced a profusion of creative and engaging ways in which to celebrate IYC.

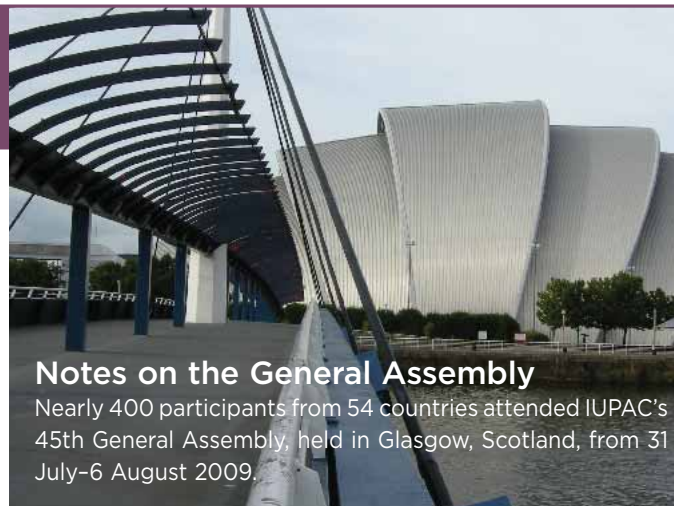


Newly elected Vice President Kazuyuki Tatsumi (left), Korea, and Ayse Zehra Aroguz of Turkey.

Former IUPAC President Bryan Henry spoke briefly about the successful World Chemistry Leadership Meeting (see article on p. 10) held 4 August, which focused exclusively on the International Year of Chemistry. He reported that a number of innovative and thoughtful ideas for IYC were presented by meeting participants, of which there were 120, nearly double the number who had signed up in advance. Henry said that he and John Malin, chair of the IYC Management Committee, will be analyzing all of the ideas and will report later on how they will be included in the celebrations.

Roundtable Discussions

Part of the second day of the Council meeting was devoted to the reports from the Council Roundtable



Notes on the General Assembly

Nearly 400 participants from 54 countries attended IUPAC's 45th General Assembly, held in Glasgow, Scotland, from 31 July-6 August 2009.

Discussions, which were back by popular demand. Successfully introduced at the 2007 GA in Torino, four round table discussions were held the afternoon of Monday 3 August. This year, the topic was one that was already on everyone's mind: IYC2011.

The discussion topics, which were the same as the goals of the IYC 2011, resulted in a number of intriguing suggestions. Each round table discussion was limited to no more than 40 participants. The organizers of each roundtable presented the results of their groups at the Council meetings.

The roundtable on "How to Increase Interest of Young People in Chemistry," led by Javier Garcia, came up with 10 ambitious ideas such as using social networking, organizing an international science quiz, and using nanotechnologists for public outreach. However, the idea that seemed to generate the most interest was Garcia's proposal to conduct the largest chemistry experiment ever by having students measure the pH of the planet and post results on the Internet. "This would not be an effort at accuracy," he explained. "It would be an effort to get students involved and get them to think about the pH of the environment and why that is important." Other ideas included developing public programs on exciting developments in research, such as in nanochemistry; publicizing the Chemistry Olympiad; sponsoring science fairs and brainstorming competitions for students; utilizing social networking tools



The Canadian delegation during voting.

IUPAC in Glasgow, Scotland



Javier Garcia (above), Spain, and Anders Kallner (below), Sweden, present ideas from the roundtable discussions.



John Corish delivers the Treasurer's Report.

such as blogs, Facebook, and Twitter; and developing meaningful classroom experiments and demonstrations for primary schools as well as middle and high schools.

Natalia Tarasova reported the results of an especially lively discussion group on "How to Generate Enthusiasm for the Creative Future of Chemistry." A number of key stakeholders participated, including Tom Tritton, president of the Chemical Heritage Foundation, and Tom Lane, president of the American Chemical Society. Tarasova suggested that sustainable development should be the focus of IYC activities. If this year had not been tied into the United Nations Decade of Sustainable Development, she said, IYC2011 would not have been approved. For this reason, one of the key suggestions of the group was to link IYC activities to the UN Millennium Goals.

A roundtable chaired by Anders Kallner discussed how to increase public appreciation and understanding of chemistry in meeting world needs. The attendees suggested that IYC2011 should involve not only the chemical profession and the general public, but should actively engage teachers as well as politicians. To do this, they suggested, it will be necessary to employ communications specialists experienced with each target constituency. Chemists should be encouraged to communicate, both in writing and on video, the satisfaction they feel in solving society's meaningful problems. This would be an effective way of publicizing job opportunities in chemistry, the group felt.

Stanislaw Penczek was chair of a roundtable focusing on how to celebrate the 100th anniversary of the Nobel Prize in chemistry awarded to Marie Skłodowska Curie. The attendees recommended production of a biographical video about Madame Curie for high school students, a Madame Curie poster, and creation of an international essay contest related to her life. They urged that proposed activities such as the celebrations in Poland, the opening ceremonies in France, and a local closing ceremony in Warsaw (December 2011) be fully publicized. The roundtable recommended that a special issue of *Chemistry International* be devoted to this anniversary, that a book be compiled of inspiring biographies of women scientists, and that IUPAC establish a Marie Skłodowska Curie Prize in Chemistry.

The roundtable presentations are available online at www.iupac.org/symposia/conferences/ga09/RoundTables.html.

Divisions and committees had been encouraged to focus their presentations on ideas for IYC2011 and leave other items for the written reports in the agenda. The ensuing flow of ideas and follow-up questions from the audience made this part of the meeting lively and engaging.

Not all of the discussion was about what IUPAC could or should do for the Year of Chemistry, some was focused on what IUPAC is doing. Associate Director Fabienne Meyers unveiled the new IYC2011 website, which will act as a clearinghouse for ideas and activities related to the year. As she explained, the simple, inviting website will provide a dynamic way for people to submit ideas, which can then be reviewed and vetted by IUPAC online. Meyers stressed that the first step in making the website an effective tool was for all IUPAC members to become part of the online community by signing up.



The Charles Rennie Mackintosh-inspired House for an Art Lover, site of the Bureau dinner.

Roars from the Council Meeting

Report from the Treasurer

In other news, John Corish delivered the Treasurer's Report in which he noted that despite the very difficult worldwide financial climate, IUPAC has held the value of its income streams during the past biennium and



maintained its full range of activities. This was despite a decrease in the overall value of its portfolio, the income of which consists of both dividends and interest and gains and losses on the values of investments. Corish also reported on the continued growth and success of the project system, on the development of the Strategic Opportunities Fund, and on the challenge, and more importantly, on the strategic opportunities

provided by IYC2011. He noted the need still very much exists for IUPAC to diversify and increase its income streams to provide for its future activities.

The treasurer also reported that the conservative investment policy pursued by the Finance Committee has served IUPAC very well during the recent turmoil in the world's markets. It both ensured the continuation of the investment stream of income and rendered the losses due to the collapse in the value of equities much less than it might otherwise have been. Nonetheless, he said, there was a decrease in the overall value of IUPAC's assets.

Corish also provided a short explanation of the IYC Fundraising Subcommittee, which he chairs. "We hope that we will be able to fund IYC on a cost-neutral basis," he said. "We will raise whatever money we need to spend."

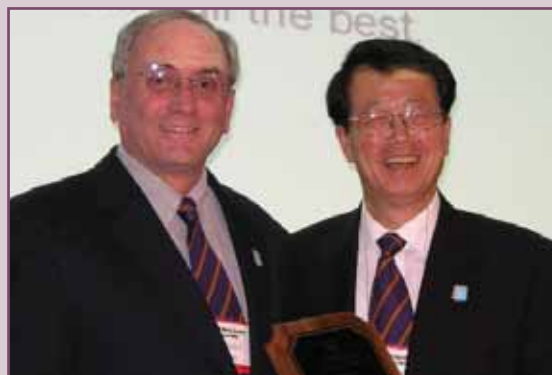
At one point in the meeting, Secretary General David StC. Black formally recognized John Jost's many years of service to IUPAC as executive director, asking Council to record its appreciation of his effective management of the IUPAC Secretariat. Since Jost will retire in August 2010, Glasgow was his last Assembly as executive director.

Council also heard a proposal from the Turkish Chemical Society to host the GA and Congress in 2013 and from the Korean Chemical Society to host the GA and Congress in 2015. Delegates approved both proposals unanimously.


Recognition and Appreciation of Service

At the conclusion of the President's Address on Saturday 1 August, IUPAC President Jung-II Jin presided over a formal ceremony to honor and recognize the service of IUPAC's retiring officers, division presidents, and standing committee chairs. Jin presented plaques to the following members:

- **Prof. Bryan Henry**, retiring as vice president, president, past president
- **Dr. Mark C. Cesa**, retiring as chair of the Committee on Chemistry and Industry
- **Prof. Leslie Glasser**, retiring as chair of the Committee on Printed and Electronic Publication
- **Prof. John W. Lorimer**, retiring as chair of the Interdivisional Committee on Terminology, Nomenclature and Symbols
- **Prof. Michel J. Rossi**, retiring as president of the Physical and Biophysical Chemistry Division
- **Prof. Pietro R. Tundo**, retiring as president of the Organic and Biomolecular Chemistry Division
- **Prof. Gerard P. Moss**, retiring as president of the Chemical Nomenclature and Structure Representation Division



Mark Cesa (left), retiring as chair of the Committee on Chemistry and Industry, receives a plaque from President Jung-II Jin.

The full text (all 272 pages!) of the Council agenda is accessible online at www.iupac.org/symposia/conferences/ga09/. 

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IUPAC in Glasgow, Scotland

WCLM Generates Ideas for IYC2011

by John Malin and Bryan Henry

The World Chemistry Leadership Meetings have been a mainstay at IUPAC Congresses or General Assemblies for many years. This year's event, held 4 August at the 2009 GA, may have been the most impressive of them all. The entire meeting was devoted to discussing the International Year of Chemistry in 2011 since, as IUPAC Past President Bryan Henry declared, "it is the most important thing IUPAC has been involved in over the last 20 years."

Although some 90 conferees had indicated they would participate, strong interest in the forum's topic attracted around 120 leaders of the chemical enterprise from industry, academia, government, and nonprofit sectors. Organized solely by IUPAC since 2001, the purpose of the WCLMs is to address special topical issues facing the world of chemistry and identify contributions IUPAC can make through projects or by working with others. Henry, who chaired the meeting, had a straightforward challenge to attendees: "How are you going to contribute to IYC2011 and how is your organization going to contribute?"

The breadth of responses was encouraging. An impressive lineup of speakers from all corners of the globe—Ethiopia, Spain, Malaysia, Poland, and more—shared their organizations' IYC plans and suggested ways to unite the chemical community to carry forward the goals of the year.

By the end of the three-hour meeting, a consensus began to emerge around how those in the chemical sciences might unite around IYC. Following are some of the ideas put forth by participants:

- The chemical community should direct its efforts primarily to the public at large and not just to scientists.

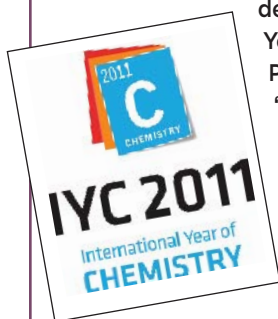
- IYC 2011 presents a special opportunity to paint a clearer picture of where the science of chemistry is going in the future, and the contributions that chemistry has made and can make.
- This opportunity will not return for some time and the community should make the most of it.
- In the particular case of Africa, the Pan African Network being established by the Federation of African Societies of Chemistry (FASC), the Royal Society of Chemistry (RSC), and the South African Chemical Institute should be supported and used to make the case of chemistry in the region.

After IUPAC President Jung-II Jin opened the WCLM, RSC President David Garner welcomed the participants on behalf of RSC and outlined the host societies' plans for the year. Because 2011 will be the 100th anniversary of the Nobel Prize awarded to Marie Skłodowska Curie, Garner announced that RSC will lead the UK celebrations of the life and achievements of Curie and highlight the contributions of women to the advancement of science. RSC plans to organize an event, jointly with IUPAC, at the French Embassy in London.

The RSC, said Garner, will designate chemical landmarks honoring Sir Humphry Davy, the Astra Zeneca Corp., and Sir Christopher Ingold. It will recognize 2011 as the 100th anniversary of Ernest Rutherford's publication of his theory of atomic structure. RSC has compiled a list of 365 chemistry milestones, one for each day of the year, to be published on the RSC website for use by students, teachers, and the public. In addition, the Royal Society of Chemistry will incorporate IYC 2011 into its portfolio of annual activities, including its Parliamentary Links program, its Bill Bryson Competition, and its series of public outreach events. Other events are proposed jointly with the Chinese Chemical Society, the American Chemical Society, and the Society of German Chemists.

Judith Benham, chair of the American Chemical Society's Board of Directors, described ACS' plans

for IYC 2011. "What," she asked, "can we do to excite and capture the public's imagination about chemistry and its contributions to humankind and its potential to



Colin Humphris, representing the International Council of Chemical Associations on the IYC Management Committee, comments on how to engage the industry and include decision makers in activities.

address global challenges, and then to provide formal and informal pathways to learning more about the discipline?"

"What can we do to excite and capture the public's imagination about chemistry?"

—Judith Benham, chair of the American Chemical Society's Board of Directors

Benham described how ACS has surveyed its current activities to determine which ones it can "repurpose" to advance the objectives of IYC 2011. She pointed out that ACS technical divisions, committees, local sections, student affiliates, and school chemistry clubs will participate during 2011 in National Chemistry Week, Earth Day, Kids & Chemistry, Chemistry Olympiads, and the Global Challenges Chemistry Solutions Podcasts. Benham noted further that the international ACS Chemistry Network will be used to help coordinate IYC2011 projects. She emphasized that IYC 2011 will show how chemistry contributes to achieving the eight Millennium Goals promulgated by the United Nations <www.un.org/millenniumgoals>.

Luis A. Oro, president of the European Association for Chemical and Molecular Sciences (EuCheMS), explained how his organization is preparing for IYC2011, pointing out that the Third EuCheMS Chemistry Conference (Nurnberg, Germany, August 2010) will be an excellent venue in which to promote the year. During 2011, he added, many EuCheMS divisions will hold their biennial conferences or organize specific seminars which will feature public lectures. Specific events include the 1st European Inorganic Chemistry Conference (Manchester, UK), the 10th Anniversary of the Stockholm Conference on Persistent Organic Pollutants (Brno, Czech Republic), the EuCheMS Conference on Chemistry for Life Sciences (Budapest, Hungary), the International Conference on Chemistry and the Environment (Zurich, Switzerland), and conferences of the Divisions of Analytical, Food, and Organometallic Chemistry.



Ting-Kueh Soon, delegate from Malaysia, talks about the Federation of Asian Chemical Societies' plans for IYC2011.

Franco Bisegna and Kevin Saidler of the European Chemical Industry Council (CEFIC) outlined ideas for IYC 2011 in terms of their organization's role in building partnerships among schools, museums, industry, and public authorities. They noted that CEFIC will assist Solvay and Essencia with the IYC2011 Closing Ceremony planned for Brussels. CEFIC's Chemishare initiative, they said, will be helpful in explaining the benefits of chemistry to the public. Additional ideas include support for creating national postage stamps celebrating chemistry, publishing a booklet on "Chemical Ideas that Changed the World," developing an advertising campaign on behalf of chemistry and the chemical industry, organizing training conferences for high school teachers, publicizing the SusChem research awards, and holding receptions and meetings with top industry and government representatives.

Bryan Henry introduced Temehegn Engida, president of FASC. Henry thanked both FASC and the Ethiopian Chemical Society for their help as lead petitioners to UNESCO and then the United Nations in the successful designation of 2011 as the International Year of Chemistry. Engida pointed out that FASC was only very recently established, and the African Federation hopes that IYC 2011 will provide impetus for the organization. Specific plans are to publicize and celebrate IYC 2011 at the Third FASC Congress (16–21 January 2011 in South Africa); to incorporate a visit from the Committee on Chemistry Education's Flying Chemists Program into the February 2011 meeting of the Ethiopian Chemical Society; to conduct a satellite workshop at the second meeting of the U.N. Economic Commission for Africa's Committee on Development Information, Science, and Technology; to organize events in African universities and schools to



Temehegn Engida, delegate from Ethiopia and president of FASC, discusses plans for IYC2011 in Africa.

IUPAC in Glasgow, Scotland

test the output of IUPAC's project on Visualizing and Understanding the Science of Climate Change; and to invite African societies and institutions to participate in IYC 2011. Engida expressed hope that support will be found to assist with funding for these activities, that additional African organizations will join FASC, that more individuals in Africa will come forward to organize activities, and that communications will be sufficient to carry the activities forward.

Peter Mahaffy, chair of IUPAC's Committee on Chemistry Education (CCE) discussed plans to emphasize IYC2011 through existing CCE activities, including the Young Ambassadors for Chemistry and the Flying Chemists Program. As noted by Engida, the Flying Chemists are planning a visit to Ethiopia in 2011. Mahaffy announced that CCE activities during IYC2011 will target school and university students as well as the general public. Mahaffy reported on four main proposals emerging from CCE's meeting earlier at the General Assembly: (1) global experiments; (2) celebrations of national stories of chemistry; (3) coordination of an international chemistry day, or week; and (4) efforts to directly contact the general public.

niques to disseminate them. An emphasis would be placed on cooperation rather than competition and particularly successful stories could be celebrated at the IYC2011 closing ceremonies in Brussels. Efforts to educate the community on how to find and record these stories will begin at the ICCE meeting in Taipei in 2010.

The CCE planners suggested that IYC2011 should incorporate national chemistry days or weeks around the world into a single, synchronous international celebration. CCE will seek to provide toolkits for organizers and develop activities that focus upon various segments of the community, such as school children of various ages, politicians, media, and the general public. Suggested advantages of a synchronous event include increased media attention and more influence on policymakers, better recognition of chemistry as a global profession, and better visibility for the global experiment(s). One proposed activity directly targeting the attention of the public is the creation of a traveling exhibit on chemistry-related postage stamps, which would also have a companion online version. Related efforts are already underway



The global experiment will engage students everywhere and will likely concentrate on worldwide sustainability themes. One proposed activity is to have students measure the pH of water systems or soil around the world, and then to display the results on a web-based map. Another idea is to have students measure isotopic ratios in water around the world at different times of the year (e.g., in February and again in December of 2011) and to record these on a web-based map.

Another CCE idea for IYC is to encourage students around the world to gather stories of chemical achievement in their own countries. The methodology will likely involve the use of cell phones to record the stories and computerized social networking tech-

to establish postage stamps celebrating the Year in countries around the world. A second activity would involve *geocaching*. Geocaches are hidden around the world and are searched for by enthusiasts. Some geocaches could be "seeded" with medallions that celebrate IYC2011.

Soon Ting-Kueh outlined the mission of the Federation of Asian Chemical Societies (FACS) as it relates to IYC2011. In addition to its scientific meetings, FACS will organize events promoting public awareness of chemistry, interest of women and young people in chemistry, and creativity and innovation. The Year will be celebrated in Malaysia during a proposed CHEMRAWN conference at the Malaysian Chemistry Festival, in Thailand at the 14th Asian Chemistry

WCLM Generates Ideas for IYC2011

Congress and at a museum developed to promote public awareness and appreciation of chemistry, during Singapore's National Chemistry Week, at the 11th Asian Congress on Analytical Sciences, and at the 6th International Conference on Cutting-Edge Organic Chemistry in Asia.

Lesley Onyon, representing the Strategic Approach to International Chemicals Management (SAICM) Secretariat at the World Health Organization, described SAICM's efforts regarding IYC2011. The "UN would like more science involved in the sound management of chemicals and the development of safe chemicals," said Onyon. "We would like to see stronger links with chemists in our work." IYC, she said, provides a good opportunity for engaging the chemistry community more fully.

Future SAICM events will include meetings scheduled for 2010 relating to health and science risk reduction, capacity building and knowledge, and the forthcoming Third International Conference on Chemicals Management scheduled for June 2012. SAICM's Quick Start Program offers key opportunities for collaboration, Onyon said.

Gabriel Infante from the Federacion Latinoamericana de Asociaciones de Quimica discussed plans for IUPAC's 2011 Congress and General Assembly, which will take place in San Juan, Puerto Rico. IYC will be prominent in the meeting program, he noted. According to Infante, several Nobel Laureates will participate in activities at the Congress, including a special session for high school students and teachers. The fact that the government of Puerto Rico has formally recognized IYC2011 should help with planning events, Infante said. Brazil and Argentina, he noted, will organize IYC2011 activities in advance of the IUPAC meetings in Puerto Rico.

After Bryan Henry thanked the presenters, he opened a general discussion of IYC2011 by posing a series of questions, listed below with responses from attendees.

Q: How can the chemical industry be involved?

A: By engaging its people and showing how industry provides solutions to world problems. It is important also to include decision makers in the discussion. IYC2011 should reach out to both large and small companies, including the pharmaceutical industry. IUPAC's Committee on Chemistry and Industry is instituting


an award in industrial chemistry, scheduled for first presentation in 2011. Industrial chemists could help by showing the personal and professional rewards of being a chemical scientist.

Q: What is the most important message about chemistry that should be carried forward to the public?

A: IYC2011's tagline "**Chemistry—Our Life, Our Future**" is an excellent slogan that should be employed with science journalists and the wider communications media. CEFIC is equipped to show chemistry's contributions to problems in housing, transportation, energy, and medicine. Their reports are forthcoming on mitigation of greenhouse gases and also on the future of the chemical industry. References to the UN Millennium Goals provide an opportunity to show how chemistry provides solutions to the important problems of humankind.

Q: What are the most effective approaches to attracting young people to the study of chemistry?

A: For example, science centers around the world are well equipped to teach young people about the wonders of chemistry. Educational materials, such as videos and publications such as personal essays, should be created showing the contributions that individual chemists have made and how their careers have contributed to science and provided them with personal satisfaction.

Two quotes from WCLM participants nicely capture some of the compelling themes from the meeting. The first is from Judith Benham, who reminded participants that the "human face of chemistry is important to show to young people." The second is from Peter Mahaffy, who at one point showed a map of the countries sponsoring the UN resolution on IYC (in yellow) and compared it with a map of IUPAC member countries (in red), revealing a dramatic difference. "This is a challenge and an opportunity," he said. "We should help these yellow countries with events, perhaps by organizing joint activities." 

Bryan Henry <chmhenry@uoguelph.ca> is IUPAC past president and a member of the IYC Management Committee; **John Malin** <jmalin023@verizon.net> is the chair of the IYC Management Committee; he recently retired from the American Chemical Society after 25 years as administrator of International Activities and Awards and as a grants administrator with the Petroleum Research Fund.

IUPAC in Glasgow, Scotland

Division Roundups

A substantial amount of the General Assembly in Glasgow was devoted to division and standing committee meetings, each of which spanned two days. Following are brief accounts of some of these meetings (part two will appear in the next issue). Prior to the GA, all divisions and standing committees provided a written report that is part of the *Council Agenda* book available online <www.iupac.org/symposia/conferences/ga09/>.

Division I: Physical and Biophysical Chemistry

by Michel J. Rossi, division president

The Physical and Biophysical Chemistry Division has 24 projects running, 8 nearing completion or recently completed, and 7 on-going interdivisional.

The Green Book remains a focal point of the division. The third edition, resulting from the activities of the Subcommittee on Symbols, Terminology and Units in Physical Chemistry, was published just in time for the GA in Torino (August 2007) and was met with great acclaim, with 782 copies sold as of April 2009. Building on this success, Division I

supported two follow-on projects: the underwriting of a student edition of the Green Book and the preparation of the translation of the Green Book into six languages (German, French, Italian, Turkish, Japanese, Portuguese).

One of the core activities of the division, and of IUPAC for that matter, is the creation and maintenance of physical and biophysical databases that are critically evaluated. Recent examples include atmospheric chemistry, ionic liquids, spectroscopic transitions of water vapor, free radical reduction/oxidation potentials in solution, annotated phase diagrams, combustion kinetics. As an increasing

number of these databases will end up on the web, IUPAC must consider policies for the maintenance and upgrade of such websites. It was suggested that large science organizations such as the U.S. National Science Foundation could be solicited for help in cases where data were of unusual utility to the science community.

For the foreseeable future, Division I may tackle energy-related questions and, in fact, already has made inroads into this technologically important field. Several aspects were felt to lie within the expertise of Division I: energy storage, hydrogen economy, materials chemistry and corrosion issues, and alternative fuels and biofuels. Some of the topics will be pursued in collaboration with Divisions III and VI.

Pierangelo Metrangolo made a presentation on the emerging field of halogen bonding, which resulted in an IUPAC proposal. Other promising projects may come from biophysical chemistry and materials chemistry.

Visits by members of other divisions triggered the interest of pursuing traceability work in experimental science for environmental measurements where long-time series and comparisons between instruments on a global scale are an issue. It behooves IUPAC to keep a close eye on the reported global watch of physical observables made in conjunction with climate change and the related problem of instrument comparability.

Division members held a wide-ranging brainstorming session on how to contribute to the International Year of Chemistry in 2011.

Division VI: Chemistry and the Environment

by Willie Peijnenburg, division secretary

As usual during GAs, the Division on Chemistry and the Environment met to review the progress of projects that are being supervised by the division, liaison with other divisions, meet with standing committees, discuss proposals for new projects, and to initiate ideas for future proposals. An important topic



Michel J. Rossi.



Members of Division VI in Glasgow.

of discussion was the status and future of the food chemistry subcommittee. On top of the division meeting, a special symposium was organized during the 42nd IUPAC conference entitled "Analytical and Risk Considerations for Emerging Environmental Issues."

Attendance at the division meeting was good: 14 out of 24 members took part. One invited observer (Sirpa Herve from Finland) and two young observers (Mohammed Shoeb from Bangladesh and Jon Schwantes of the USA) also participated.

During the meeting, it was concluded that the division is quite active: prior to the meeting, 27 projects were on the list for the 2008–2009 biennium. Eleven of the projects have been successfully finished by means of either a technical report or by the organization of a workshop or related activity. Of note are the two new volumes prepared for the series of books on Biophysico-Chemical Processes in Soil Environments. The division is also employing the Web to disseminate its work (e.g., <agrochemicals.iupac.org> and <www.iupacio2009.org>). Further efforts are needed to maintain and update the Web sites.

A number of new projects were discussed, such as chemical recycling and management of waste; measurement procedures used in estimation of global pollution; and the role of carbohydrates in leaching of metals.

Prior to the Glasgow GA, a proposal was brought forward for the institution of an Interdivisional (I, III, V, VI) Committee on Green Chemistry. The division positively supported the proposal to establish the committee, and awaits feedback from other divisions.

The division participates in the activities of the Interdivisional Committee on Terminology, Nomenclature and Symbols by reviewing technical reports submitted for publication in *Pure and Applied Chemistry*. Of special interest is the Glossary of Terms Used in Ecotoxicology (IUPAC Recommendations 2009) by Monica Nordberg, Douglas Templeton, Ole

Andersen, and John Duffus since the glossary is very impressive and may be very helpful not only for ecotoxicologists themselves and researchers working in the fields of environmental chemistry, but for risk assessors and regulators as well. It was agreed that in the future the Division of Chemistry and the Environment should collaborate more actively with other committees and ICTNS. Such joint projects may promote comprehensive, interdisciplinary approaches to terminology that is used in different fields. This may help to avoid numerous mutual misunderstandings that often occur. It was agreed that a proposal will be prepared for a glossary on environmental chemistry.

A continuous problem for the division remains the implementation of an active subcommittee on food chemistry; strengthening the subcommittee is essential, since this is the only division that is active in the area of food chemistry. Topics of interest are "nanoparticles in food and feed" (both natural and synthetic nanoparticles) and "allergens." It was decided to strongly revive the activities within the area of food chemistry, with Christoph von Holst as the nucleus. Among others projects, a workshop on "Emerging Chemicals in Food and Feed" will be organized.

In general, the division officers were pleased with progress of the division activities. As a matter of course, the division will contribute actively to activities initiated within the International Year of Chemistry. At the closing of the meeting there was a big word of thanks for the services of the division members who will leave the division after varying numbers of years of service within IUPAC. Fortunately, most of the departing members have indicated that they wish to stay involved in the work of the division.

Division VII: Chemistry and Human Health

by Doug Templeton, division president

The Division of Chemistry and Human Health met at the Glasgow GA to review its activities for the past year and plan for the next biennium. Planning for IYC includes initiatives in highlighting the role of chemistry in furthering our health, and exploring the interplay between our health and our environment.

A significant development in the division is activity to harmonize nomenclature in medical laboratory science. Common terminology is being developed among (1) the IUPAC/IFCC-owned NPU database,

IUPAC in Glasgow, Scotland: Division Roundups

(2) Systematized Nomenclature of Medicine—Clinical Terms of the International Health Terminology Standards Development Organization in Copenhagen, and (3) the Logical Observation Identifiers Names and Codes at Indiana University. This initiative is conducted



Doug Templeton.

by the Subcommittee on Nomenclature for Properties and Units. Legal agreements to proceed are being put in place, and the ultimate outcome will be a common global vocabulary for expression of properties and units in the clinical laboratory.


A major contribution of the Subcommittee for Medicinal Chemistry and Drug Development is the awarding of the USD 10 000 IUPAC-Richter Prize for lifetime contributions in medicinal chemistry. Previous winners are Malcolm Stevens

for the development of several anticancer drugs (including Temodal™), and Jan Heeres for discovery of ketoconazole and development of other conazole antimycotics. The prize will be awarded again in 2010. The work of the three winners will be highlighted as part of IYC; for instance, by disseminating taped video interviews aimed at a lay audience.

A major output of the Toxicology and Risk Assessment Subcommittee is the publication of a unique textbook called *Concepts in Toxicology* (Royal Society of Chemistry, 2009, ISBN 978-0-85404-157-2). The book contains a series of essays placed in a conceptual framework that offers a new way of understanding toxicology from the molecular and cellular, to the environmental and legislative levels. The subcommittee also hosted a symposium on “Bioinorganic Toxicology: Poison or Cure?” at the Congress, where Peter Sadler gave the keynote address on “Using Coordination Chemistry to Design New Medicines.” A website has been established by the Toxiclaro project, jointly with Universiti Sains Malaysia, that teaches children (and hopefully by extension, their parents) about the safe use of pesticides. It can be found at <ww.pn2.usm.my/toxicology2009> (see article on page 17).

The division has implemented a limited sponsorship that grants endorsement for relevant meetings and symposia to organizations that must then display

the words “IUPAC Division of Chemistry and Human Health” on their advertisements and abstract booklets. They must also afford the opportunity to publicize the division’s activities. Sponsorship decisions are made rapidly at the divisional level.

The division introduced a program of emeritus fellowship to involve and honor those who have previously made outstanding contributions to the division and to IUPAC itself. Our initial inductees are Stanley Brown, René Dybkaer, Urban Forsum, Philippe Grandjean, Lester Mitscher, Henrik Olesen, Bill Sundermann Jr., John Topliss, and Camille-Georges Wermuth. In the future, each of the three subcommittees will appoint one emeritus fellow at each General Assembly. 



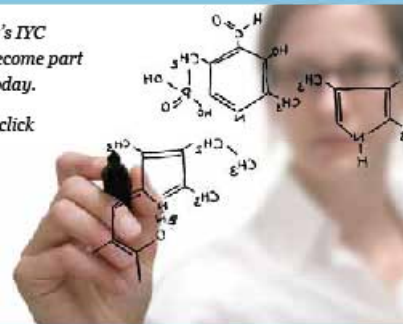
International Year of
CHEMISTRY
2011

The International Year of Chemistry 2011 (IYC 2011) is a worldwide celebration of the achievements of chemistry and its contributions to the well-being of humankind. Under the unifying theme “Chemistry—our life, our future,” IYC 2011 will offer a range of interactive, entertaining, and educational activities for all ages.

The Year of Chemistry will extend across the globe with opportunities for public participation at the local, regional, and national level.

Contact your country’s IYC representative and become part of the IYC Network today.

*Visit the website and click on **Connect** to join the network.*



To keep in touch with the happenings of IYC 2011, go to www.chemistry2011.org for the latest news, activities listings and ideas.

Toxicology in the Classroom



by Maizurah Omar and Rahmat Awang

Although nonchemical methods exist to control pests, pesticides are essential for farming economies of today, especially in developing countries and countries with economies in transition. However, infants and children are particularly vulnerable to pesticides and other toxic chemicals because their bodies are smaller and still developing. Children also face greater exposure than adults due to their hand-to-mouth behaviors. And children living in farming areas or whose parents work in agriculture suffer greater pesticide exposure than other children.

A recently completed IUPAC project was designed to raise awareness among young children about the potential adverse effects of chemicals and, in the process, help reduce the careless use of pesticides. Carefully developed over the past four years, "Toxicology in the classroom" (Toxiclaro for short) is a multimedia resource that will help teachers educate their students about pesticides and health. Toxiclaro is a virtual toolbox, offering training materials, a curriculum, and resources such as games, experiments, and a virtual house to explore—all of which provide for a basic understanding of toxicology and awareness of the need for protective and precautionary measures.

The Toxiclaro initiative originated from the IUPAC Chemistry and Human Health Division and the IUPAC Committee on Chemistry Education (CCE), which formally met to plan the project in May 2005 at the Federal Agency for Risk Assessment, Berlin, Germany. The project is managed by a task group of professionals from the World Health Organization (WHO), IUPAC, and the National Poison Centre of Malaysia.

The project also is an expansion of a project of the International Programme on Chemical Safety of the World Health Organization. The IPCS multilevel course aims at training different groups of people in the sound management of pesticides. The course material addresses trainers and technical and medical personnel. The Toxiclaro project aims to expand this approach to young people, educating them about protecting themselves from the harmful effects of pesticides and hazardous chemicals, and developing a safety culture for the future.

Development of the Courseware

This article describes the underlying theory that guided the entire web-based courseware development project. The following discussion explains briefly the terms "technology" and "instruction" in the context of teaching and learning through multimedia, to enable the reader to appreciate three important learning theories that grounded the project's development. From the theories emerged a model that we used to systematically help us develop the courseware prototype. We also employed some crucial design principles and guidelines to further help us with the details in building the courseware.

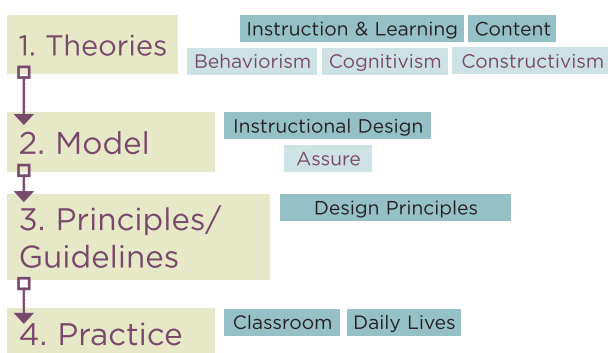
Theoretical Framework and Instructional Approaches

The Toxiclaro prototype is based on a top-down research model that encompasses theories, and principles about the best instructional approach for this type of multimedia material.

In the context of this project, the term "technology" refers to both product and process. The term "instruction" refers to a systematic process of arranging information and the environment to facilitate learning. The environment, in this case, refers not only to where instruction takes place but also to the method, media, and equipment needed to convey information and guide the learner. Learning is defined as the development of new knowledge, skills, or attitudes as an individual interacts with the information and the environment.¹

Following are some of the questions the instructional media designer had to answer before embarking on the development of the courseware:

- What knowledge and skills are meant to be imparted by this multimedia courseware? How



Flow Chart for the Theoretical Framework and Instructional Approach of the Toxiclaro project.



Toxicology in the Classroom

can the instructional media designer be sure that the information delivered has been received by the learner as intended?

- How much information has actually been understood by the learner and how much of this information did the instructional media designer and content developer want the learner to understand?
- How do children ages 7-13 learn?
- What are the appropriate materials?
- Can animation, text, and audio increase the potential for children to learn and remember new information as well as to apply it in their daily routines?

The learning theories of behaviorism, cognitivism, and constructivism were instrumental in designing the courseware.

Behaviorism

According to this theory, objectives or intentions should be clearly stated and the focus should be on delivering the facts. In this context, the learner is simply a recipient of instruction. Behaviorist theory refuses to speculate on what goes on in a learner's brain when learning takes place; therefore, the assessment of outcomes relies solely on observable results, such as correct and incorrect answers on questionnaires/exercises. As a result, behaviorism has limited utility for designing instruction for higher-level skills such as evaluations or problem solving. For this reason, the designer drew upon a few elements of behaviorism, but drew more heavily upon the theory of cognitivism.

The following elements of behaviorism are integrated into the courseware:

- clear-stated objectives for each lesson
- exercises such as quizzes with multiple choice and open-ended questions
- evaluation of recalling facts (e.g., naming of pesticides, risks of pesticides)
- reward achievement and motivate learning (i.e., using reinforcement words such as "Well done!")
- remedial exercises to reduce failure in learning

Cognitivism

The theory of cognitivism explains how information is received, processed, and manipulated by the learner. According to the theory, new information is initially stored in short-term memory, but only if the information is "rehearsed" will it be stored in long-term memory. Because short-term memory is limited, only a

small amount of information can be attended to at any given time. In scientific terms, the capacity of short-term memory is limited to 7+ - 0 chunk of information. An effective way to maximize the storage available in short-term memory is to present it in a variety of forms (i.e., multimedia), such as images, spoken and written text, video, and animation. "Rehearse," "practice," and "repeat" are important elements to ensuring new information is moved to long-term memory.

Yet, our brain is also greatly influenced by our perception, which determines how we interpret what we see. The brain automatically selects and organizes sensory information (dominated by the visuals) to fit with desired outcomes. Perception is therefore a great challenge to any instructional media designer. Media designed to deliver knowledge and skills should be able to first attract the viewer's attention and then to sustain it throughout the process.

Piaget described three major components of mental development: schemata, assimilation, and accommodation.¹ Schemata are mental structures individuals use to organize their perceived environment. These schemata are adapted or changed during mental development and learning. They are used to identify, process, and store incoming information. As a result, individuals learn to classify objects according to their significant characteristics. These cognitive structures change by the process of assimilation and accommodation. Assimilation is the cognitive process whereby the learner integrates new experiences into existing schemata, constantly elaborating them. When new experiences do not fit, a modifying process or accommodation takes place resulting in the development of new schemata and existing schemata are extended.





Toxicology in the Classroom

Cognitivism acknowledges the uniqueness of individual children, who have their own schemata, their own environment. Therefore, instructional media must engage children's existing schemata, so that new information can be stored in long-term memory. Information should be broken into subtopics and should be presented in logical sequences, with many examples, and employing sounds, images and text. Children need choices that resonate with their own learning styles, including the ability to repeat material or reply to it.

Following are elements of cognitivism integrated in the courseware:

- forward and backward buttons to allow "Rehearse," "practice," and "repeat"
- multimedia, such as sounds, spoken words, text, pictures, and animations
- attractive layout design, stories, and interactive games to grab attention and motivate
- information broken into parts and logical sequence
- evaluation on higher cognitive skills such as categorization, classification, synthesis, analysis, abstraction, and judgment (e.g., cause and effect of different kinds of pesticides)

Constructivism

Constructivism focuses on the learner's prior knowledge and cognitive development. Using this approach, the learning environment is made as rich as possible to enhance students' ability to construct or assemble knowledge and resolve difficulties in solving problems. Heinich et. al make a clear distinction between the role of instruction in behaviorism and constructivism. According to them, instruction should not merely dispense facts but should provide ways to assemble knowledge. Many of the things we learn in childhood end up as inert knowledge that cannot be used despite being stored in long-term memory. We may have failed to make sense of new information, or the knowledge may be no longer useful. Knowledge is always dynamic, changing or becoming obsolete over time. Constructivism is very much concerned with this and emphasizes the importance of using existing knowledge to gain and apply new knowledge.

The focus of the designers of the Toxiclaro material is to build learning environments that take into consideration the specific needs of individual students and actively engage them in constructing new knowledge and meaningful experience. Most of the new information presented in the courseware is linked to, or in the form of, situated learning experiences, such as the

daily activities encountered in children's own homes and surroundings.

The following elements of constructivism are integrated in the courseware:

- choices in learning such as stories, games, experiments, and lectures
- real-life stories about pesticides and chemicals for meaningful learning
- use of local environments to introduce new knowledge
- use of the scaffolding technique such as teacher's notes and teacher's guide to facilitate teaching and learning
- encouragement of elaboration thinking such as story telling, experiments, and variety of examples
- evaluation of higher cognitive skills such as the ability to solve problems, make predictions, and critical judgment

Process Technology: "ASSURE" Model

There are more than 40 models commonly used in instructional design. The most simple and common is the ASSURE model, which was used for the Toxiclaro project. The acronym stands for:

- A—Analyze Learner**
- S—State Objective**
- S—Select Method, Media, and Materials**
- U—Utilize Media and Materials**
- R—Require Learner Participation**
- E—Evaluate and Revise**

Analyze Learner

The first step taken by the instructional media designer was to understand the character profile of our target audience. Most of the data gathered were from teachers and books related to the way children in specific age groups learn and behave.

State Objective

Each topic was broken into clear objectives that can be observed and measured. Some of the objectives were written in terms of degrees of achievement, such as asking users to provide at least three examples of pesticides.

Select Method, Media, and Materials

This task is extremely challenging and time consuming. On-going discussions, feedback, and formative assessments are activities that are regularly performed

Toxicology in the Classroom

by the instructional designers, teachers, multimedia developers, and content experts. Up-to-date, real-life case studies, tested laboratory experiments, references, pedagogical and layout design were important issues for the development team. The team also worked with young children to help develop story telling and games as well ideas to enrich instruction.

The instructional media designer used these design principles to help guide the work:

- legibility
- easy interpretation
- interactivity

Utilize Media and Materials.

The courseware was previewed and pretested by individuals and small and large groups at schools and conferences. In all the sessions, feedback received was used to edit and enhance the courseware.

Require Learner Participation

Most of the instruction used in the courseware invites and encourages learner participation through games, experiments, and quizzes, and through the variety of examples given for each topic.

Evaluate and Revise

The courseware designers used formative as well as summative evaluations. Most of the formative evaluations were carried out during the process of development. These included presentations to, discussions with, and feedback from content experts, instructional design experts (i.e., teachers), multimedia and graphic designers, and children. Formative evaluations consisted of children's assessments in the form of quizzes. Summative evaluations of learners' achievement have also been developed that can be used by teachers at the end of each topic.

Background


A workshop to review a draft version of the Toxiclaro package was held 15 August 2008 immediately following the WHO/EURO meeting on "Sound Management of Pesticides—Risk Reduction," Bonn, Germany. This was attended by Rahmat Awang, Nida Besbelli, Birger Heinzow, and Wayne Temple. Several amendments were suggested at this meeting that were incorporated by Awang and his informatics team in Malaysia. Awang had demonstrated the software to delegates at the WHO meeting prior to the workshop.

Awang subsequently delivered a PowerPoint presentation entitled "The Design and Development of a

Multimedia 'Toxicology in the Classroom' Courseware for Young Children" at the 7th Annual Congress of the Asia Pacific Association of Medical Toxicology, 8-10 December 2008 in Chandigarh, India.

Next Steps

The project team will test run the courseware in three countries to further enhance its quality. This will involve organizing a series of train-the-trainer workshop for instructors and teachers on how to use the courseware. In this regard, the designers are planning to produce a training guide. Another component of the project will involve classroom monitoring, supervision, and reporting to ensure the courseware is properly implemented, to evaluate its effectiveness, and make improvements if needed.

An amended version of the Toxiclaro multimedia package can be found at <www.prn2.usm.my/toxicology2009>. Group members are currently reviewing this material and hope to finalize the project by the end of 2009. 

Team Members

IUPAC Project Members: Wayne A. Temple, chair; Rahmat Awang; Nida Besbelli; John H. Duffus; Birger Heinzow; Irma Makalinao; Maizurah Omah; Lutz Rexilius; and Fritz Schweinsberg.

Pedagogical Experts: Maizurah Omar (instructional design and technology), Maznah Omar (science specialist for classroom teaching), Maizuyah Omar (chemistry specialist classroom teaching), Nurulain Ramli (chemistry teach teacher), and Bedariah Abdullah (biology teacher).

Multimedia Designers: Maizurah Omar (visual literacy), Nooreha Md. Salehen (graphic and animation), Muhammad Haifizullah Mohammad (multimedia), and Latifah Zaidi (graphic).

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A Tribute to Máximo Barón

by Michael Hess

Máximo Barón turned 80 in February 2009. Hard to believe. It was only yesterday when I met him for the first time! Yesterday? “Yesterday” was 1995, at the IUPAC General Assembly in Guildford, UK. I was invited as an observer, and Máximo was already a distinguished titular member of the IUPAC Commission on Macromolecular Nomenclature, with a splendid scientific career.

His career started in Argentina where, as a young pupil with an unquenchable thirst for knowledge, he decided that he would become a scholar. However, he was also always dedicated to the experiment, curious to figure out how things work (e.g., photography). From the very beginning, he was fortunate to have teachers and mentors who understood his potential and introduced him to a variety of fields, such as chemistry, physics, history, and philosophy.

One of Máximo’s friends, E. Emmett Reid, a former professor at John Hopkins University, was 92 when he stated “I am interested in research and research is the future.” Since Máximo Barón will never stop being interested in the future, perhaps he will never really grow old.

It is not pure knowledge, but perception that is Máximo’s goal, and this is what he wants to share with his students. This drive was probably catalyzed during his early studies of epistemology with Vicente Fattone, one of the most outstanding Argentine philosophers of his time. Chemistry or physics, he absorbed everything that passed his curious eyes when reading, working in the lab, having discussions with colleagues. He was unknowingly following the road of science as taken by Alexander von Humboldt and Wilhelm Ostwald. Máximo would eventually come to believe, like Ostwald before him, that he had chosen the best path a young student can take for his profession. These early decisions, experiences, and encounters with gifted teachers at high school and university still echo in his teaching today. Even at the age of 80, Máximo Barón is still an active and respected teacher at the University of Belgrano—Facultades de Ciencias Exactas y Naturales e Ingeniería y Tecnología Informática, Argentina.



In 1947, he received a “Bachiller” degree from the Colegio Nacional de Buenos Aires. In 1954, the Doctor in Química from Facultad de Ciencias Exactas y Naturales Universidad de Buenos Aires. After a year as a research assistant at the Instituto Tecnológico, Argentine Ministry of Industry, he joined the Eastman Kodak Research Laboratories in Rochester, New York, USA. After two years, he returned to Argentina to ATANOR SAM Research Laboratories in Buenos Aires. In 1965, after two years as a teaching assistant in the Physics Department of the University of Buenos Aires, Máximo Barón accepted an invitation from George Wright of the Chemistry Department at the University of Toronto, Canada. He had drawn the attention of Wright for his isolation and characterization of an until-then-unidentified chloral tetramer. He spent a very fruitful year in Toronto meeting students from many parts of the world and learned the extraordinary rigour and surgical manner in which his host ran his science, not the easy way, but enduring. In particular, that year in Toronto assured him that academia certainly was the world where he belonged and not the industrial environment that he had also experienced.

Once back in Buenos Aires, he became an assistant professor, associate professor, and, finally, in 1982, a full professor of physics at the University of Buenos Aires. In 1997, he became professor of Physics at the University of Belgrano, Buenos Aires, where he was research coordinator from 1998 to 2000. During these years, numerous students went through his hands and graduated under his experienced advice.

One of his preferred fields of expertise became the dielectrical spectroscopy that he continued after his year in Toronto. Orville Thomas (Salford, UK), Mansel Davies, and Robert Cole were friends, tutors, and mentors who had a profound effect on his career. He entered the developing field of liquid crystals and liquid crystalline polymers. Later, he prepared two important documents for publication for the IUPAC Polymer Division. Between 1978 and 1992, he was a frequent participant in the Gordon Conferences on Dielectric Phenomena.

Barón’s international activities included stints as a visiting scientist at the Kemisk Lab at the Royal School of Pharmacy, University of Copenhagen (1971); as a visiting lecturer at the University of Salford, UK, (1971);

A Tribute to Máximo Barón

guest scientist at the Instituto de Investigaciones Bioquímicas, Fundación Campomar, Buenos Aires, (1974); visiting scientist at the Francis-Bitter National Magnet Lab, MIT-Boston, USA, (1984); visiting professor, School of Physics, National University of San Luis, San Luis, Argentina, (1988); visiting scientist, Dielectrics Group, King's College, University of London, London, (1991, 1993, 1995); and, finally, as visiting professor at the School of Engineering Sciences, University of Osaka, Japan, 1996.

Besides authoring numerous scientific papers, he has written many book chapters and books, including the Spanish adaptation of *Invitation to Chemical Research* (in collaboration with E. Emmet Reid), 1969; *Elementary Thermodynamics* (1977); *Concepts of Thermodynamics* (1998); or a chapter on "J.J. Thompson and his Hydrogen Model" in *Models and Modellers of Hydrogen*, A. Lakhtakia, Pennsylvania State University (1996).

His research interests are matter-energy interactions, dielectric properties, magneto-optics in mesophases, symmetry and chirality, structure of small-ring molecules. In teaching, he favors polymer nomenclature and terminology, general chemistry and physics, history of science and technology, and scientific information research and retrieval.

In 1987, the Argentine Chemical Society proposed that he become the national representative on the IUPAC Commission on Macromolecular Nomenclature.

Norbert Bikales, who was the commission's secretary at that time, invited him to collaborate on the commission's various projects. He commented on the drafts of documents whenever he felt he could contribute and was surprised that his term was extended after two years because he did not exactly feel like an expert in nomenclature. In 1990,

Pavel Kratochvil, chair of the commission at that time, invited Barón to attend the commission meeting at the IUPAC General Assembly in Hamburg. Pavel's letter of invitation helped Barón raise funds for his travel to Hamburg. This was his first opportunity to meet the other members of the commission in person, and he was surprised by the spirit of the group in which names or titles mattered much less than what a person contributed and how she or he fit in the team.

After the Hamburg meeting, a very fruitful time began during which he cooperated on many docu-

ments. In particular, the two documents on liquid crystals became his "children," which he finally prepared for publication. Aubrey Jenkins, Bob Stepto, Jaroslav Kahovec, Pavel Kratochvil, and Bill Work, just to name a few, became his close friends. Soon, he was elected associate member, then, in 1997, titular member at the GA in Geneva. Having achieved this status made it easier to join the meetings and he could even combine his travels to meetings with further extracurricular scientific activities. In 1999, when Bill Work ended his term as secretary of the commission, Máximo Barón was asked to be his successor under the chairmanship of Bob Stepto.

During that time, I had the pleasure to meet this gentleman-scientist, to work with him, and to benefit from his scientific knowledge, social competence, psychological skills, and human warmth. What is a commission without a good secretary who keeps track of things and teams-up well with the chairperson? Frequently, the secretary is the one who prevents the chairman from being sucked too deeply into discussions and, in doing so, makes sure that a commission is run efficiently, sometimes through background discussions that take the steam out of issues, mediating behind the scene and making things run more smoothly. There can be no good chairman without a good secretary, and Máximo Barón is one of the best.

Although Máximo claims that he never really understood the reasons for his successful career, all those who had the chance to cooperate with him know the reasons very well. There were turbulent waters we had to steer through when IUPAC restructured, and Máximo's advice was a great help in passing through these rapids. Although he has since retired as secretary, he is still a well-respected and active honorary member of Division IV, the Polymer Division.

Aside from those I mentioned above, Ernest L. Eliel and D.H.R. Barton also were important mentors to Barón. However, I should mention first and foremost those who made Máximo Barón's career possible: his family. Without their support, little of the above would have been possible.

Máximo is also proud of having been accepted as a fellow, chartered chemist, and chartered scientist by The Royal Society of London. He is also a member of the Argentine Chemical Society, the American Chemical Society, the Argentine Scientific Society, the American Association of Physics Teachers, the Argentine Historians Society, and the Argentine History of Science Group.

It is not pure knowledge, but perception that is Máximo's goal, and this is what he wants to share with his students.

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Update of IUPAC Glossary of Physical Organic Chemistry

A task group has been formed to update the IUPAC *Glossary of Terms Used in Physical Organic Chemistry*. The original glossary had been compiled under the auspices of the IUPAC Subcommittee on Physical Organic Chemistry and published in *Pure and Applied Chemistry*, 1994, 66, 1077-1184. In 1997, a Web version was created: www.chem.qmul.ac.uk/iupac/gtpoc/. The glossary will be updated to include new terminology that has developed, to revise ambiguities, to respond to inquiries, to make it consistent with other IUPAC glossaries, and to establish procedures for continual revision and expansion.

For more information and comments, contact Task Group Chair Charles L. Perrin <cperrin@ucsd.edu>

 www.iupac.org/web/ins/2009-002-1-300

Reference Methods, Standards, and Applications of Photoluminescence

More than 20 years ago, David Eaton undertook the task of collecting information on fluorescence methods and materials as a task of the IUPAC Commission on Photochemistry. Two relevant documents evolved from this work: "Reference Materials for Fluorescence Measurement," [*Pure and Applied Chemistry*, 1988, 60(7), 1107-1114]; and "Recommended Methods for Fluorescence Decay Analysis," [*Pure and Applied Chemistry*, 1990, 62(8), 1631-1648]. Since Eaton's documents were written, new reference materials have been published and the subject has evolved rapidly with the incorporation of new areas and methods of fluorescence that were not understood or poorly developed at that time. A few examples are single molecule fluorescence, ultrafast fluorescence detection, and fluorescence microscopy. Many of these subcategories are of utmost relevance in materials science and in biology. In general, interest has shifted to organized, (micro) heterogeneous systems.

A nearly completed IUPAC project, begun almost six years ago, has been systematically updating all IUPAC documents on fluorescence, including advances registered during the last 20 years. Nearly 15 documents will be issued and published as an outcome of this project, which gives particular attention to newly developed reference materials and methods.

The scope of the work has been broadened for

this project to include luminescence from molecular emitters in their triplet state or states with mixed spin multiplicity, quantum dots, and more. Thus, the term "fluorescence" appearing in the earlier documents has been replaced by the far more comprehensive term "photoluminescence." "Reference methods will include recommendations for the calibration of luminescence measuring systems; the correction of emission, excitation, action, and polarization spectra; the determination of quantum yields in different spectral ranges; and the determination of lifetimes or decay kinetics in the various achievable time scales. Whenever possible, extension to nondilute, unclear, or complex systems of applied interest will be performed.

At present, 13 documents have been drafted, all of which will be issued under the signature of one or more authors. They carry the primary responsibility for the written material. However, all documents have profited from the criticism and the contribution from all Task Group members, whether they participated or not in active writing. Style uniformity and fulfillment of IUPAC rules will be pursued in a final step, in which internal and external consistencies will be checked. Final documents will be submitted successively.

The first titles in the series are as follows:

1. Fluorescence Standards: Classification, Terminology and Recommendations on their Selection, Use and Production, by U. Resch-Genger, P.C. DeRose
2. Characterization of Photoluminescence Measuring Systems, by U. Resch-Genger, P. C. DeRose
3. Determination of the Photoluminescence Quantum Yield of Dilute Dye Solutions, by K. Rurack, U. Resch-Genger
4. Standards for Photoluminescence Quantum Yield Measurements in Solution, by A.M. Brouwer
5. Fluorescence Anisotropy Measurements in Solution: Methods and Reference Materials, by M. Ameloot, M. vandeVen, A. U. Acuña, B. Valeur
6. Time-Resolved Fluorescence Methods, by H. Lemmetyinen, N. Tkachenko, B. Valeur, N. Boens, M. Ameloot, N. Ernsting, T. Gustavsson, J.-I. Hotta

Preview drafts are available on request as opinions, criticisms and comments from the photochemical community are kindly requested.

The project is divided into different sections:

- I. Steady-state Luminescence Measurements
- II. Time-resolved Spectroscopy and Decay Analysis
- III. Single Molecules and Microfluorimetry
- IV. Luminescence Measurement in

The Project Place

Microheterogeneous, Heterogeneous, Highly Absorbing and Complex Systems

Documents 1 to 4 belong to Section I, as they deal mainly with steady-state measurements, document 6 to Section II, and document 5 pertains to both sections, as it involves both steady-state and time-resolved measurements. The remaining documents to be issued correspond to Sections III and IIV.

For more information and comments, contact Task Group Chairs Albert M. Brouwer <fred@science.uva.nl> or Enrique San Román <esr@qi.fcen.uba.ar>.

 www.iupac.org/web/ins/2004-021-1-300

Experimental Requirements for Single-Laboratory Validation

The objective of this recently initiated project is to provide expert guidance on the scope and scale of experiments required for single-laboratory method validation, enabling regulatory agencies to harmonize validation requirements.

This new project will develop guidance on experimental designs suitable for determining method performance characteristics during single laboratory validation experiments. Where possible, the resulting report will include guidance on numerical values for such performance characteristics.

The output is intended to support implementation of the existing IUPAC Harmonized Protocol on Single-Laboratory Validation (PAC 2002, Vol. 74, No. 5, pp. 835–855), which specifies the performance characteristics to be assessed, but currently includes

no quantitative guidance on the scale of experimentation required.

It is currently envisaged that the guidance will be informed by statistical power considerations; that is, experimental requirements will be set so as to achieve a particular probability of correctly identifying significant adverse effects (such as a specified upper limit for bias). The guidance will indicate the power appropriate for different situations. For example, verification of performance of an established method, validation of a new method, or validation of a new method intended for critical uses would attract increasingly stringent requirements. It is envisaged that the report will include example simple-experiment designs and associated tables of replicate numbers for each such situation so that regulators can easily specify the level of stringency required and analysts can easily identify the scale of experimentation necessary to meet the requirement.

The requirements will be chosen so that they broadly reflect and harmonize current best practice. The advantage of specifying requirements in terms of test power as well as listing specific experiments and experiment sizes is that it then becomes possible to permit any experiment design that is designed to achieve the necessary confidence. This provides for flexibility in specifying single-laboratory validation requirements, and allows analysts to design improved experiments which have greater efficiency while being able to demonstrate that the stringency is sufficient.

For more information and comments, contact Task Group Chair Steven L.R. Ellison <s.ellison@lgc.co.uk>.

 www.iupac.org/web/ins/2009-006-1-500

Provisional Recommendations

Name and Symbol of the Element with Atomic Number 112

A joint IUPAC/IUPAP Working Party (JWP) has confirmed the discovery of the element with atomic number 112 by the collaboration of Hofmann et al. from the Gesellschaft für Schwerionenforschung mbH in Darmstadt, Germany. In accordance with IUPAC procedures, the discoverers proposed a name, copernicium, and symbol, Cn, for the element. The Inorganic Chemistry Division now recommends these proposals for acceptance.

This proposal lies within the long tradition of naming elements to honor famous scientists. Nicolaus

Copernicus was born on 19 February 1473 in Torún, Poland, and died on 24 May 1543 in Frombork/Frauenburg. His work has been of exceptional influence on the philosophical and political thinking of humankind and on the rise of modern science based on experimental results.

Comments by 31 January 2010

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 www.iupac.org/reports/provisional/abstract09/corish_310110.html

The Underlying Foundation of Science Used in the Regulation of Industrial Chemicals

by Joseph Plamondon

Published by iSmithers—A Smithers Group Company
Shawbury, Shrewsbury, Shropshire, UK, 2009
ISBN: 978-1-84735-148-7 (Softback)

reviewed by Bernard West and Michael Booth

A new book by Joseph Plamondon presents a survey of the different approaches to regulating chemicals in the United States and Europe, with the occasional comment about the Canadian system. *The Underlying Foundation of Science Used in the Regulation of Industrial Chemicals* compares the U.S. federal government's Toxic Substances Control Act (TSCA) and the European Commission's (EC) Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) legislation.

Plamondon presents the rationale for developing these regulations clearly as a balance of risk versus benefit. The survey of the risk factors and the way in which each jurisdiction handles the risks is explained and is a valuable insight into the different approaches. While he comments on the underlying theory of risk analysis, he does not comment on the bigger political problem of the outrage factor described in Sandman's work.¹ Sandman describes Risk as the Hazard multiplied by Outrage. An equation, which drives the formulation of regulation and the basis for banning products, overwhelming the more logical scientific approach.

The chapter on substance naming conventions is also very thorough and underlines the difference between the U.S. and E.U. approaches, namely that the E.U. relies upon the IUPAC naming conventions and the USA relies upon the Chemical Abstract Services naming. The problems of multiple naming, even within the IUPAC convention, clearly shows that there is a need for a common convention. No doubt this is wishful thinking, as this would reduce the opportunity for playing non-tariff item games in the future.

One common approach that is being pursued is the Simplified Molecular Input Line Entry Specification (SMILES), which is effectively a computer code for a given structure of substance. IUPAC is developing something similar called The International Chemical Identifier (InChI). Again, we need to develop a truly international standard, not a two solitudes approach.

However, an interesting thought about these approaches is that they might be more amenable to dealing with characterizing the sizes and shapes of substances, which will likely be needed for regulation of nanomaterials in the future.

Chapters 4 and 5 of the book describe, with examples, some of the difficulties arising from naming issues under TSCA and the challenges arising under REACH. Chapter 6 takes a look at the thorny problem of polymers and the contrasting approaches of the different jurisdictions. Very large molecular weight polymers are treated as benign by systems, but the shorter chain polymers can be reactive and the systems vary in how they handle them.

Chapter 7 discusses the problems that nanotechnology presents to both systems of regulation and outlines some of the recent examples of how each system is handling the issues. It will be some time before any broad approaches are developed, but meanwhile individual issues are being regulated. At some point, there will need to be standardized ways of characterizing "new" substances that are on a nanoscale and shape. Perhaps an extended application of SMILE or InChI would be helpful.

The final chapter provides a summary and an indication of where substantial work to improve the weaknesses of both systems should occur.

We would like to see an attempt to develop a common worldwide system for characterizing substances. IUPAC would be a good vehicle for this. The interpretation of the information and translation into regulations could remain a national prerogative, but it would certainly help to have a common approach there, too. Such a system would help with the risks of chemicals down the value chain and into places where there is no production and no regulation.

TSCA is a mature system that is being improved incrementally. REACH is new, having replaced the former, much weaker E.U. system, and is therefore a step change. It is clear that both systems have their challenges and this book provides a broad understanding of the challenges and an idea about some of the needs for the future.



Bookworm

The number of new and existing acronyms are a challenge for anyone who has an aversion to AFA (Another Flipping Acronym); however, there is a fulsome list of abbreviations in the appendix. IUPAC also comments on the use of abbreviations.²

In summary, we recommend this book to anyone who faces the need to get a new substance registered in North America or Europe. It is not only useful to regulatory affairs practitioners, but also useful background for researchers and marketers, as it indicates the enormity of the task of bringing a product to market.

References

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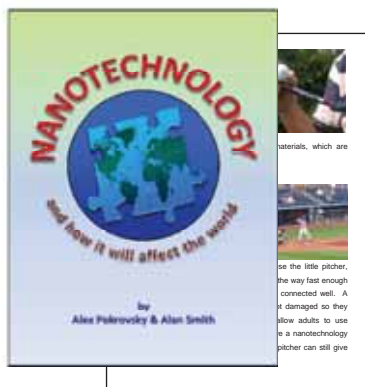
2. "Use of Abbreviations in the Chemical Literature (IUPAC Recommendations 1979)," David R. Lide, Jr. *Pure and Applied Chemistry*, 1980, Vol. 52, No. 9, pp. 2229-2232; doi:10.1351/pac198052092229

Bernard West <bernard.west@sympatico.ca> has a extensive experience in the chemical industry, most recently as CEO of Cansolv Technologies of Montreal, Canada. He is chair of several boards involved in new chemistry developments and is a member of the IUPAC Committee on Chemistry and Industry.

Michael Booth <caiainfo@iafrica.com> is the secretary/treasurer of the IUPAC Committee on Chemistry and Industry. He is currently the director of information resources at the Chemical & Allied Industries' Association in South Africa.

Nanotechnology for Schools and the General Public

Chemistry International has published five articles on the exciting topic of nanotechnology, including ones on healthcare, sports and leisure, water, biomimetics, and new chemistry. Now, the author of these articles has produced a small 32-page booklet on the applications of nanotechnology. Topics covered are a general



description of what nanotechnology is, along with sections on transport, sports and leisure, home, healthcare, energy, environment, risks and benefits, and future directions. The booklet is well illustrated, and should appeal to a wide age range from schoolchildren to the general public.

Nanotechnology for Schools and the General Public is available for free following request to <info@iupac.org>.

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A Tribute to Máximo Barón

From 1993 to 1999, he was a member of the editorial board of *Speculations in Science and Technology* (Chapman & Hall). Since 1992, he has been a member of the editorial board of *Ciencia e Investigación*, the *Argentine Journal for the Advancement of Science*, and, since 1996, he has been a member of the editorial board of the *Journal for Materials Education*, University of North Texas, USA.

In addition to scholarships from the Canadian National Research Council of Canada and the University of Toronto, Máximo Barón received the History Science Award (History of Physics in Argentina) in 1980 and the Awards for Scientific and Technological Productions for the years 1992-1994. In 2000, he was invited to the

Weiss Graduate Scholars program of the Pennsylvania State University.

Eighty years of a fruitful life, much of it spent in science. We are fortunate that Máximo Barón dedicated a significant share of his time to IUPAC and Division IV. He has provided us with a perfect example of how to work effectively in a multinational scientific organization: scientific competence, patience, and mutual respect. Máximo has helped to create the high spirit and family-like atmosphere of the Committee of Macromolecular Nomenclature's Subcommittee on Polymer Terminology that we all have enjoyed. This has made the "dry" discussions about terminology and nomenclature much more palatable. We all thank Máximo Barón for his contributions and friendship and send him our best wishes. 🍷

Conference Call

Advanced Materials

by Michael Hess

The 17th POLYCHAR Conference—Annual World Forum on Advanced Materials, held 21–24 April 2009, was organized by Jean-Marc Saiter and his team at the Institute of Materials Research of the University of Rouen, Technopole du Madrillet, Saint Etienne du Rouvray in Haute Normandie, France. A Short Course on Polymer Characterization was held on 20 April.

The conference, and the many fruitful discussions during breaks and excursions, brought together theorists; researchers involved in modelling, synthetic chemistry, and processing; students; distinguished scientists; and newcomers to materials science and engineering.

The forum focused on the following areas:

- Nanomaterials and Smart Materials
- Electrical and Dielectric Properties
- Surfaces and Interfaces
- Structure-Properties Relationships
- Materials Synthesis
- Biomaterials, Green Polymers, Biodegradable Polymers, Recycling
- Mechanical Properties and Performance
- Rheology and Processing

There were 164 participants from 40 countries and 4 continents, presenting some 250 contributions. Many students attended the presentations and 60 presented their own results. It is not at all the intention of

POLYCHAR to have a high number of participants and parallel sessions but rather to attract young scientists and advanced and graduate students to give them the opportunity to meet with colleagues and well-known scientists to exchange experiences, make contacts, and present their results to the scientific community. There were 30 invited and special lectures together with 116 regular oral contributions.

The annual POLYCHAR Conferences, which have been IUPAC-sponsored for several years, are well known for combining materials science with polymeric materials. The name “POLYCHAR” has its origin in polymer characterization. The short course is an educational project of the IUPAC Polymer Division.

As already noted, POLYCHAR encourages student and young investigator presentations in particular. Although encouraged by the organizers to present oral contributions, many students' presentations were found in two poster sessions comprising 136 excellent contributions.

The POLYCHAR Prize Committee, chaired by Goerg Michler, Martin Luther University of Halle-Wittenberg, awarded a number of prizes. The Carl Klason Prize for the Best Student Paper was awarded to three *ex aequo* winners:

- Vivian Ikem, Imperial College London for her paper on highly porous polymer foams synthesized from templates
- Renata Pires, Federal University of Rio de Janeiro for her presentation on tailor-made copolymers for reduction of friction in aqueous solutions



Participants at the 17th POLYCHAR Conference—Annual World Forum on Advanced Materials.

Conference Call

- David Yan Dong, University of Washington, Seattle, for his presentation on patterned electrochromic polymeric windows

Diplomas of Distinction for Student Presentations were awarded as follows:

- Mohammad Ali Aravand, Torbiat Modares University, Tehran, Iran, for his presentation on phase inversion emulsification of epoxies with non-ionic block emulsifiers
- Lyubov Bardash, Institute of Macromolecular Chemistry, Kyiv, and University of Lyon, for her presentation on performance modification of poly(butylene terephthalate) by multiwall carbon nanotubes

IUPAC Diplomas of Distinction for a Student Poster Presentation were awarded as follows:

- Khadidja Arabeche, Martin Luther University, Halle-Wittenberg and University of Rouen, for presentation on multilayer films in confinement geometry
- Yoo-Shung Choi, Chosun University, Gwangju, South Korea, for his presentation on flame retardant composites containing inorganic waste fillers
- Orathai Pornsunthorntawe, Chulalongkorn University, Bangkok, Thailand, for a presentation on surface modification of biopolymeric films via adsorption of a biosurfactant

The Bruce Hartmann Award for a Young Scientist went to Caroline Terrié, University of Rouen, for her presentation on biodegradable materials from agro-based byproducts. The Jürgen Springer Award for a Young Scientist was given to Haley E. Hagg Lobland, University of North Texas, Denton, for her presentation on brittleness of materials and its implications for composites and impact testing. The International Materials Science Prize, introduced in 2007, was awarded to Alexander Bismarck, Imperial College London, for his work on nanocomposite foams and emulsion templating and for his successful international cooperations.

The conference is also a platform for the esteemed Paul J. Flory Research Award. This year, it was given *ex aequo* to Elizabete F. Lucas, Federal University of Rio de Janeiro, for her pioneering work on the application of polymeric materials in many stages of petroleum extraction and processing; Masaru Matsuo,

Nara Women's University, for his pioneering work on gelation and crystallization; and to Ron Sanderson, University of Stellenbosch, for his work establishing and developing advanced polymer science in South Africa.

It is difficult to select particular contributions from the multitude of excellent oral and poster contributions from universities, research institutes, and industry without overlooking important contributions. However, the following presentations were certainly highlights of the conference:

- "Experimental Characterization and Constitutive Modelling of Polycarbonate under Changes of Temperature, Strain, and Strain Rate," M. Negahban, A. Goel, K. Strabala, J. Vogeler, R. Feng
- "Conditioning Polymers in Supercritical Fluids," Jiasong He
- "Mainchain-Type Organoboron Quinolone Polymers: Synthesis and Photoluminescence Properties; Yoshiki Chujo, Yuuya Nagata, Atsushi Nagai
- "Antireflection and Superhydrophobicity of Nanostructured Polymeric Films," Han Sup Lee, Ki Woon Choi, Yi Seul Yang, Joon Ho Lee
- "Toughness enhancement of Multicomponent Polymers: Nanomechanical Background," Goerg H. Michler
- "Intermingled Polymer Gels and Organogels," Jean-Michel Guenet, Debarshi Dasgupta, Ayyapanpillai Ajayaghosh, Cyrille Rochas, Witold Brostow, Haley E. Hagg Lobland, and R.P. Singh
- "Active Sensing and Repair in Polymer Composite Materials," Véronique Michaud, Eva Kirkby, Rui De Oliveira, and Jan-Anders Månson

The Short Course on Polymer Characterization, an integral part of the conference, is taught by well-known specialists who provide a basic overview for students and newcomers as well as an update on popular characterization techniques. A unique feature of the course is that the lecturers are available for the participants during the whole conference. Due to IUPAC sponsorship, it was possible to waive the fee for all students. There were about 50 course participants. The subjects addressed were as follows:

- "Thermophysical Methods," Michael Hess, Germany
- "Dynamic Mechanical Analysis," Kevin P. Menard, USA

Conference Call

- "Chromatography," Dusan Berek, Slovakia
- "Microscopy for Morphology," Goerg Michler, Germany
- "Tribology," Witold Brostow, USA
- "Solid-State NMR," C. Lorthioir, France
- "Light-, Neutron-, and X-ray Scattering by Polymer Systems," J.-M. Guenet, France
- "Rheology," H. Muenstedt, Germany

Each presenter has the opportunity to submit a manuscript, based on his or her presentation, to the POLYCHAR Scientific Committee. The manuscripts will be published in scientific journals after the usual process of peer review. Macromolecular Symposia and Chemistry & Chemical Technology are all willing to publish POLYCHAR-17 papers.

Future POLYCHAR conferences are scheduled as follows:

- POLYCHAR-18, Siegen, Germany, April 2010
- POLYCHAR-19, Katmandu, Nepal, 2011
- POLYCHAR-20, Zagreb, Croatia, 2012
- POLYCHAR-21, Gwangju, South Korea, 2013

For more information see <www.unt.edu/POLYCHAR>.

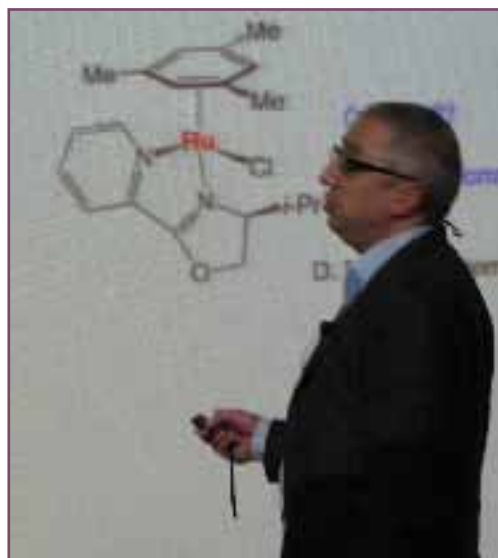
Heterocyclic Chemistry

by *Lisa McElwee-White*

The **10th Annual Florida Heterocyclic and Synthetic Conference** was held 8-11 March 2009 in Gainesville at the University of Florida. Attendees had the opportunity to participate in an excellent program that included 12 plenary lectures, 40 invited lectures, 5 short courses, and a poster session. Short courses were taught by William Dolbier (University of Florida) on synthesis of fluorinated compounds, John Joule (University of Manchester) on azoles, Ronald Castellano (University of Florida) on non-covalent interactions of aromatics and heterocycles in molecular recognition, Gordon Gribble (Dartmouth College) on the applications of metals in heterocyclic chemistry, and Girolamo Cirrincione (University of Palermo) on eight-membered heterocyclic rings.

Plenary lectures were presented by the following scientists:

- Mike Martinelli, Arena Pharmaceuticals, USA



Amir Hoveyda, giving a plenary lecture at the 10th Annual Florida Heterocyclic and Synthetic Conference.

- Chris Senanayake, Boehringer Ingelheim, Germany
- Amir Hoveyda, Boston College, USA
- Ben Feringa, University of Groningen, The Netherlands
- Janine Cossy, EPSCI, France
- Frank Fang, Eisai Research Institute, USA
- Stephen Martin, University of Texas, USA
- Joel Hawkins, Pfizer, USA
- Erick Carreira, ETH, Switzerland
- Philip Kocienski, University of Leeds, UK
- Koji Nakanishi, Columbia University, USA

The more than 175 attendees at the conference, included approximately 40 graduate students and postdocs; along with academic and industrial research chemists from more than 30 countries. Heterocyclic compounds are of particular importance to the pharmaceutical industry and many of the industrial delegates came from this area. The conference attracted a number of commercial exhibitors, including publishers, chemical suppliers, and instrument makers.

Lisa McElwee-White is a professor of Chemistry at the University of Florida and a former titular member of the Organic and Biomolecular Chemistry Division Committee.

Where 2B & Y

Carbohydrate

1–6 August 2010, Tokyo, Japan

The **25th International Carbohydrate Symposium** (ICS2010) will be held in Tokyo, Japan, from 1–6 August 2010. The symposium is one of the premier events in carbohydrate chemistry and biochemistry, biennially organized under the auspices of the International Carbohydrate Organization. The 2010 event will mark the 50th anniversary of the first meeting held in 1960 in Gif-sur-Yvette, France.

Reflecting rapid expansion of the field, the scope of the symposium will be broad. It will cover diverse aspects of glycosciences, which include chemical and enzymatic synthesis, chemical biology, glycobiology, therapeutics, structural biology, and industrial applications. ICS2010 will cover the following fields of glycosciences:

- Synthesis and Reactions
- Chemical Biology
- Analytical Methods
- Enzymology
- Glycobiology



- Therapeutics
- Structural Biology
- Glycomics
- Informatics
- Materials and Biotechnology
- Industrial Applications

The symposium will take place in the conveniently located Makuhari Messe, which is easily accessible from Narita International Airport. Accommodation at hotels in Makuhari area will be arranged, so that most of the participants can stay within walking distance of the symposium venue.

Symposium organizers are planning a number of activities, including a reception, excursions to various sites around Tokyo, and a symposium banquet to promote mutual friendship and exchange of ideas.

The symposium chair is Tomoya Ogawa, RIKEN Yokohama Institute, and the vice chair is Yukishige Ito, RIKEN Advanced Science Institute.

 www.bilingualgroup.co.jp/ics2010

Organometallic Chemistry

18–23 July 2010, Taipei, China

The **24th International Conference on Organometallic Chemistry** will be held at Taipei International Convention Center from 18–23 July 2010. 24th ICOMC 2010 will provide a forum for in-depth assessment of the challenges involved in the dynamic and fast-moving field of organometallic chemistry and related research endeavors. It will bring together all leading chemists from all over the world to exchange and present the latest discoveries and developments.

The six-day conference program will feature plenary lectures, invited lectures/communications, and oral and poster presentations covering the following topics:

1. organometallic chemistry with transition metals, lanthanides, and main group elements

2. organometallic catalysis: new synthetic methods, enantioselective catalysis, C-H bond activation and functionalization, alkene metathesis, and cascade reactions
3. polymerization and polymers
4. metal- and heteroatom-based molecular organometallics for materials
5. catalysis and organometallics for green chemistry and energy
6. bioinorganics and bioorganometallics in biology and medicine
7. theoretical and physical methods, bonding and reaction mechanisms in organometallic chemistry
8. self-assembly and supramolecular chemistry involving organometallic skeletons

 www.icomc2010.tw

Chemistry for the Development of the Arab World

20–22 April 2010, Albaath University, Homs, Syrian Arab Republic

The biennial Arab Chemical Conference, which plays an important role in the Arab scientific community, involves outstanding chemists who present their findings and innovations in various fields of chemistry. The conference also enables the exchange of information and ideas on various aspects of chemistry, chemical technology, and chemical education that often leads to new innovations that will further enhance economic development and improve the quality of life in the Arab world.

The **15th Arab Chemical Conference** will be held in Homs, Syrian Arab Republic, 20–22 April 2010. The objectives of the conference are as follows:

1. further scientific and technological development in the chemical sciences
2. utilize chemistry expertise and knowledge for

3. development in the Arab world
4. develop a vision for achieving a clean and safe environment.
5. advance chemistry education in the Arab world
6. encourage the exchange of experiences among Arab researchers and chemists

The purpose of the conference is to bring together scientists from universities, research institutes, and industry in the Arab region and around the world to discuss developments and new perspectives in chemistry and chemistry education. Plenary and invited lectures will be included in the conference program.

Oral and poster presentations as well as panel discussions will be organized around these topics:

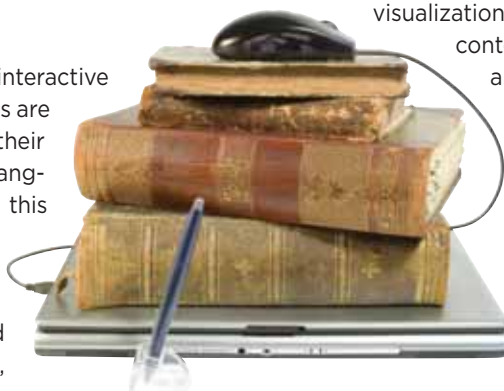
- New Trends in Chemistry
- Chemistry for Sustainable Development
- Chemical Wastes, Reduction, Treatment, and Recycling
- Nano Chemistry and its Applications
- New Trends in Teaching and Learning Chemistry

For more information, contact Saleh Al Fahili <Alfahili-s@homsonline.com> at the Syrian Chemical Society, Homs.

Interactive Publications and the Record of Science

8 February 2010, Universite Pierre et Marie Curie, Paris, France.

The Web is, by nature, an interactive environment, yet online journals are mostly static, consistent with their traditional role as a never-changing scholarly record. However, this traditional role is increasingly challenged as browser technologies leap forward, dynamic visualization and presentation tools proliferate, and primary data are linked to research articles. In an important and timely event arranged by ICSTI (the International Council for Scientific and Technical Information), publishers, publishing service providers, librarians, editors, and authors will meet in Paris for a full-day workshop



to survey the most exciting and challenging of the new developments and to begin to identify the necessary infrastructure for including interactive content within the record of science. Session topics are (I) Interactive visualizations; (II) Adding value with enriched content and semantic links; (III) The archival problem and infrastructure for solutions; (IV) W(h)ither journals? Speakers include representatives from the Nature Publishing Group, National Library of Medicine, Royal Society of Chemistry, International Union of Crystallography, OECD, Concept Web Alliance, SciVee, British Library, CrossRef, and Cell Press.

Because seats are limited, advance registration is required.

 www.icsti.org/events.php

Mark Your Calendar

Upcoming IUPAC-sponsored events
See also <http://www.iupac.org/indexes/Conferences>
for links to specific event websites

2009

 IUPAC poster prizes to be awarded

9–12 November 2009 • Crop Protection • Rio de Janeiro, Brazil

3rd International Workshop on Crop Protection Chemistry in Latin America: Environment, Safety and Regulation
See IUPAC Project 2007-057-1-600 or E-mail: secretariat@iupacrio2009.org

15–18 November 2009 • Macromolecular Complexes • Termas de Chillán, Chile

13th International Symposium on Macromolecular Complexes
Prof. Bernabé L. Rivas, Universidad de Concepción, Facultad de Ciencias Químicas, Concepción, Chile
Tel.: +56 412 204 109, Fax: +56 412 245 974, E-mail: mmc13-chile@udec.cl

2010

 IUPAC poster prizes to be awarded

6–9 March 2010 • Chemistry and Industry • Kuwait City, Kuwait

Kuwaiti Conference of Chemistry
Dr. Abdulaziz Al-Najjar, KCS president, The Kuwait Chemical Society, P.O.Box 39151, Nuzha, 73052 Kuwait
Tel: +965 22510351, Fax: +965 22522096, E-mail: kw_chemical@yahoo.com or kw_chemical@hotmail.com

7–10 March 2010 • Heterocyclic Chemistry • Gainesville, Florida, USA

11th Florida Heterocyclic and Synthetic Conference
Prof. Alan R. Katritzky, University of Florida, Department of Chemistry, Gainesville, FL 32611-7200, USA
Tel.: +1 352-392-0554, Fax: +1 352-392-9199, E-mail: katritzky@chem.ufl.edu

7–10 April 2010 • POLYCHAR 18 • Siegen, Germany

18th International Conference on Polymer Characterization; World Forum on Advanced Materials
Professor Werner Mormann, Universität Siegen, FB-8, Makromolekulare Chemie, Adolf Reichwein Strasse 2
D-57068 Siegen, Germany
Tel.: +49 271 740 4713, Fax: +49 271 740 2226, E-mail: mormann@chemie.uni-siegen.de

5–11 June 2010 • Spectral Line Shapes • St. John's, Newfoundland, Canada

20th International Conference on Spectral Line Shapes
Prof. John K. C. Lewis, Memorial University of Newfoundland, Department of Physics and Physical
Oceanography, St. John's, NL A1B 3X7, Tel.: + 709 737 8849, Fax: + 709 737 4569, E-mail: court@mun.ca

6–10 June 2010 • Electrochemistry • Belgrade, Serbia

2nd Regional Symposium on Electrochemistry: Southeast Europe
Prof. Vesna B. Miškovic-Stankovic, University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4,
11000, Belgrade, Serbia, Tel.: + 381 11 330 3488, Fax: +381 11 337 0387, E-mail: vesna@tmf.bg.ac.rs

4–8 July 2010 • Pesticide Chemistry • Melbourne, Australia

12th IUPAC International Congress of Pesticide Chemistry
Dr. Elizabeth Gibson, RACI, 1/21 Vale Street, North Melbourne, VIC 3051, Australia
Tel.: +61 0 3 9328 2033, Fax: +61 0 3 9328 2670, E-mail: elizabeth@raci.org.au

5–8 July 2010 • Polymer-Solvent Complexes • Strasbourg, France

8th International Conference on Polymer-Solvent Complexes and Intercalates
Prof. Jean-Michel Guenet, Université de Strasbourg, Institut Charles Sadron—CNRS, 23, Rue de Loess
F-67034 Strasbourg, Tel.: + 33 038 841 4087, Fax: + 33 038 841 4099, E-mail: guenet@ics.u-strasbg.fr

11–16 July 2010 • Macromolecules • Glasgow, UK

43rd International Symposium on Macromolecules—IUPAC World Polymer Congress (Macro 2010)
Prof. Peter A. Lovell, School of Materials, The University of Manchester, Grosvenor St. Manchester, M1 7HS, UK
Tel.: +44 (0) 161-306-3568, Fax: +44 (0) 161-306-3586, E-mail: pete.lovell@manchester.ac.uk

11–16 July 2010 • Photochemistry • Ferrara, Italy

XXIII IUPAC Symposium on Photochemistry
Prof. Franco Scandola, Dipartimento di Chimica, Università di Ferrara, Via L. Borsari 46, I-44100 Ferrara, Italy
Tel.: +39 05 32 455 160, Fax: +39 05 32 240 709, E-mail: snf@unife.it

25-30 July 2010 • Solubility Phenomena • Leoben, Austria 

14th International Symposium on Solubility Phenomena and Related Equilibrium Processes

Prof. Heinz Gamsjäger, Montanuniversität Leoben, Lehrstuhl für Physikalische Chemie,

Franz Josef Strasse 18, A-8700 Leoben, Austria

Tel.: +43 (0) 3842 402 4804, Fax: +43 (0) 3842 402 4802, E-mail: heinz.gamsjaeger@mu-leoben.at

1-6 August 2010 • Chemical Thermodynamics • Tsukuba, Japan 

21st International Conference on Chemical Thermodynamics

Prof. Kazuya Saito, Department of Chemistry, Graduate School of Pure and Applied Sciences, University of

Tsukuba, Tsukuba, Ibaraki 305-8571, Japan

Tel.: +81 29 853 4239, Fax: +81 29 853 6503, E-mail: kazuya@chem.tsubuka.ac.jp

1-6 August 2010 • Organic Synthesis • Bergen, Norway 

18th International Conference on Organic Synthesis

Prof. Leiv K. Sydnes, Department of Chemistry, University of Bergen, Allégaten 41, N-5007 Bergen, Norway

Tel.: +47 55 58 34 50, Fax: +47 55 58 94 90, E-mail: leiv.sydnes@kj.uib.no

1-6 August 2010 • Carbohydrate • Chiba, Japan

25th International Carbohydrate Symposium

Prof. Yukishige Ito, RIKEN Advanced Science Institute, 2-1 Hirosawa, Wako, Saitama 351-0198, Japan

Tel.: + 81 48-467-9430, Fax: + 81 48-462-4680, E-mail: yukito@riken.jp

8-13 August 2010 • Chemical Education • Taipei, Taiwan 

21st International Conference on Chemical Education—Chemistry Education and Sustainability in the Global Age

Prof. Mei-Hung Chiu, National Taiwan Normal University, No. 88, Ding-Zhou Road, Section 4, Taipei, 116, Taiwan

Tel.: + 886 2-2932-2756, Fax: + 886 2-2935-6134, E-mail: mhc@ntnu.edu.tw

15-19 August 2010 • Green Chemistry • Ottawa, Canada 

3rd IUPAC Conference on Green Chemistry (ICGC-3)

Prof. Philip Jessop, Department of Chemistry, Queen's University, 90 Bader Lane, Kingston, ON, K7L 3N6, Canada

Tel.: +1-613-533-3212, Fax: +1-613-533-6669, E-mail: info@icgc2010.ca

22-27 August 2010 • Physical Organic Chemistry • Busan, Korea 

20th International Conference on Physical Organic Chemistry

Prof. Dae-Dong Sung, Department of Chemistry, Dong-A University, Saha-Gu, Busan 604-714, Korea

Tel.: +82 51 200 7243, Fax: +82 51 200 7259, E-mail: ddsung@dau.ac.kr

19-23 September 2010 • Heavy Metals in the Environment • Gdansk, Poland

15th International Conference on Heavy Metals in the Environment

Prof. Jacek Namiesnik, Department of Analytical Chemistry, Gdansk University of Technology, G. Narutowicza

11/12, PL-80 233 Gdansk, Poland, Tel.: + 48 58 347 1345, Fax: +48 58 347 2340, E-mail: chemanal@pg.gda.pl

6-10 October 2010 • Eurasia Chemistry • Amman, Jordan

11th Eurasia Conference on Chemical Sciences

Dr. Amal Al-Aboudi, Chemistry Department, University of Jordan, Amman 11942, Jordan

Tel.: +962 6 535 5000, Fax: +962 6 535 5522, E-mail: alaboudi@ju.edu.jo

Visas

It is a condition of sponsorships that organizers of meetings under the auspices of IUPAC, in considering the locations of such meetings, should take all possible steps to ensure the freedom of all bona fide chemists from throughout the world to attend irrespective of race, religion, or political philosophy. IUPAC sponsorship implies that entry visas will be granted to all bona fide chemists provided application is made not less than three months in advance. If a visa is not granted one month before the meeting, the IUPAC Secretariat should be notified without delay by the applicant.

How to Apply for IUPAC Sponsorship

Conference organizers are invited to complete an Application for IUPAC Sponsorship (AIS) preferably 2 years and at least 12 months before the conference. Further information on granting sponsorship is included in the AIS and is available upon request from the IUPAC Secretariat or online.

www.iupac.org/symposia/application.html

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- Arsenic Pollution and Remediation: An International Perspective, 31(4)
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- Climate Change: Observed Impacts on Planet Earth, 21(5)
- Compendium of Polymer Terminology and Nomenclature, 32(4)
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- Functional Food and Health, reviewed by Antonio Monge, 26(2)
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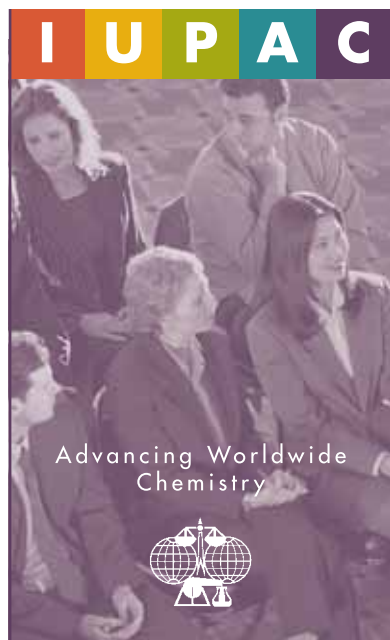
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Biological Surfaces and Interfaces, 27 June–2 July 2009, Sant Feliu, Spain, 36(3)
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Challenges in Thermodynamics Applied to Materials World, 1–6 August 2010, Tsukuba, Japan, 32(5)
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- Conference on Organometallic Chemistry, 18–23 July 2010, Taipei, China, 30(6)
- Crop Protection Chemistry in Latin America, 9–12 November 2009, Rio de Janeiro, Brazil, 38(3)
- EuCheMS Chemistry Congress, 29 August–2 September 2010, Nürnberg, Germany, 33(5)
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- Heteroatom Chemistry, 30 June–4 July 2009, Oviedo, Spain, 37(3)
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- Interactive Publications and the Record of Science, 8 February 2010, Paris, France, 31(6)
- Mediators of Science: Women Translators, 28 July–2 August 2009, Budapest, Hungary, 30(2)
- Molecular Environmental Soil Science, 10–14 October 2009, Hangzhou, China, 35(4)
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- Vacuum Microbalance and Thermoanalytical Techniques, 21–24 June 2009, Kazimierz Dolny, Poland, 29(2)



IUPAC Prize for Young Chemists

Supporting the future of chemistry

The encouragement of young research scientists is critical to the future of chemistry. With a prize of USD 1000 and paid travel to the next IUPAC Congress, the **IUPAC Prize for Young Chemists** encourages young chemical scientists at the beginning of their careers. The prize is based on graduate work and is given for the most outstanding Ph.D. thesis in the general area of the chemical sciences, as described in a 1000-word essay.

Call for Nominations: **Deadline is 1 February 2010.**

For more information, visit www.IUPAC.org/news/prize.html or contact the Secretariat by e-mail at secretariat@iupac.org or by fax at +1 919 485 8706.



IUPAC



GEDEON RICHTER LTD.

IUPAC and Gedeon Richter, Ltd. Announce the 2010 IUPAC-Richter Prize in Medicinal Chemistry *Call for Nominations*



The IUPAC-Richter Prize is to be awarded to an internationally recognized scientist, preferably a medicinal chemist, whose activities or published accounts have made an outstanding contribution to the practice of medicinal chemistry or to an outstanding example of new drug discovery.

The prize has been established by a generous gift from the **Chemical Works of Gedeon Richter, Ltd.** (Budapest, Hungary) to acknowledge the key role that medicinal chemistry plays in improving human health.

Application is by **NOMINATION** only with one person needing to serve in that capacity, although a total of five (5) individuals should be listed as referees overall. The package should contain a complete resume, a professional autobiography

of not more than two pages, and a one-page summary of what the individual considers to be his/her activities, accomplishments and/or publications that have had the most significant impact upon the field of Medicinal Chemistry.

The material will be confidentially forwarded to an independent selection committee appointed by the IUPAC Subcommittee on Medicinal Chemistry and Drug Development.

The first prize was awarded in 2006 to Malcolm F.G. Stevens and the second in 2008 to Jan Heeres. The third Prize will be presented in 2010 during the EFMC International Symposium on Medicinal Chemistry in Brussels, Belgium.

Nomination materials should be submitted by **31 December 2009** to:

IUPAC Secretariat

by e-mail to <secretariat@iupac.org>
tel.: +1 (919) 485 8700, fax: +1 (919) 485 8706



Prize: USD 10 000

Deadline: 31 December 2009

For further information, please visit <www.iupac.org/news/Richter_prize.html> or contact Professor C. Robin Ganellin, chair of the IUPAC Subcommittee on Medicinal Chemistry and Drug Development, by e-mail at <c.r.ganellin@ucl.ac.uk>.

21st International Symposium on Medicinal Chemistry (EFMC-ISM)

5–9 September 2010, Brussels, Belgium

EFMC-ISM 2010 is being organized by the Medicinal and Bioorganic Chemistry Division of Royal Flemish Chemical Society and the Division for Medicinal Chemistry of the Société Royale de Chimie, on behalf of the European Federation for Medicinal Chemistry. This symposium traditionally attracts experts in drug research and development, in particular medicinal and synthetic chemists, combinatorial chemists, molecular modelers, pharmacologists, as well as development chemists. It is recognized worldwide as one of the leading Medicinal Chemistry meetings, as proven by its large international attendance.

www.ismc2010.org

